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KIM R. WILSON, Utah State Bar No. 3512
DAVID L. PINKSTON, Utah State Bar No. 6630
SCOTT H. MARTIN, Utah State Bar No. 7750
P. MATTHEW COX, Utah State Bar No. 9879
SNOW, CHRISTENSEN & MARTINEAU
10 Exchange Place, Eleventh Floor
Post Office Box 45000
Salt Lake City, Utah 84145-5000
Telephone: (801) 521-9000
Facsimile: (801) 363-0400
Attorneys for COP Coal Development Company

UNITED STATES DEPARTMENT OF THE INTERIOR
OFFICE OF HEARINGS AND APPEALS
INTERIOR BOARD OF LAND APPEALS

COP COAL DEVELOPMENT COMPANY, Appellant. (Appeal of November 17, 2011 BLM decision approving Minor Modification of R2P2, Castle Valley Mine No. 4)	IBLA _____ **PETITION FOR STAY PENDING APPEAL (43 C.F.R. 4.21)** **[Oral argument requested]** 3482 (UTG 023) UTU-73342 (LMU) U-020668 (Lead Coal Lease)

Pursuant to 43 C.F.R. § 4.21, C.O.P. Coal Development Company, ("COP"), hereby petitions for a stay, pending appeal, of the decision of the United States Department of Interior, Bureau of Land Management, Green River District, Price Field Office (the "BLM"), dated November 17, 2011, entitled "Approval of Minor Modification", "Re: Minor Modification to

Resource Recovery and Protection Plan (R2P2), Castle Valley Mine No. 4, Castle Valley Mining, LLC, Operator" (the "BLM Decision"). COP submits this Petition, together with its Notice of Appeal of the BLM Decision, a copy of which is served on the Board. A copy of the BLM Decision is attached hereto as Tab 1. It is also attached to COP's Notice of Appeal.

I. BACKGROUND FACTS

In January, 2008, an involuntary bankruptcy case was commenced against C.W. Mining Company ("CWM"), in the United States Bankruptcy Court for the District of Utah, Case no. 08-20105. Kenneth A. Rushton was ultimately appointed Chapter 7 Trustee (the "Trustee"). *Declaration of Charles Reynolds in Support of Petition for Stay, dated December 15, 2011 ("Reynolds Dec.")* at 6.

COP is the fee owner of certain real property within the Bear Canyon Logical Mining Unit (LMU) UTU-73342, including the property on which is located the Bear Canyon Mine or, as identified in the BLM Decision, Castle Valley No. 3 and No. 4 Mines (the "Mine"). COP is also the fee owner of certain coal and is the lessee under various Federal coal leases related to coal owned by the BLM, some of which are identified below. *Reynolds Dec.* at 7.

In March of 1997, COP and CWM entered into a "Coal Operating Agreement", whereby COP granted to CWM the right "to operate and control" the Mine for purposes reasonably incidental to mining for a period of 25 years. In CWM's bankruptcy case, the Trustee sold CWM's rights under the Coal Operating Agreement to Castle Valley Mining, LLC ("Castle Valley"), the applicant in this matter. COP and others objected to the motion, and a trial was held. *Reynolds Dec.* at 8. A copy of the "Order Authorizing Sale of Mine Assets Free and Clear

of All Liens..." (the "Sale Order"), entered by the Bankruptcy Court on August 4, 2010, is attached hereto at Tab 2 (including a copy of the Operating Agreement). Attached at Tab 3 are relevant pages of the transcript of the hearing on the objections to the Sale Order.

On or about December 14, 2010, the BLM (Utah State Office) received an R2P2 modification request from Castle Valley, related to the Mine. The proposed modification sought to change the layout in the Tank Seam of the Mine by changing the mining method from longwall (which had been approved in July, 2006) to room-and-pillar mining, resulting in a change to the layout, timing, and recoverable tonnage projection for the entire LMU, UTU-73342, which includes Federal coal leases SL-025431; SL-069985; UTU-024316; UTU-024318; UTU-46484; UTU-020668; UTU-38727; UTU-51923; UTU-61048; and UTU-61049. On January 7, 2011, the BLM (Utah State Office) issued a decision approving the requested modification (the "January 7 Decision"), a copy of which is attached hereto at Tab 4. *Reynolds Dec.* at 9.

On February 4, 2011, COP timely appealed the January 7 Decision, which appeal has been assigned IBLA No. 2011-112 ("Appeal 2011-112"). In its Statement of Reasons and Petition for Stay in that appeal, COP argued that the January 7 Decision violated COP's due process rights because even though COP is the landowner and Federal lessee, the modification (which potentially impacts COP's rights and responsibilities) was approved without its input, approval or consent.

On or about July 29, 2011, Castle Valley submitted a revised mine plan for the Mine, seeking a modification to the R2P2, affecting the mining layout and timing of the continuous

miner sections in certain coal areas and leases in the "Tank Seam" of the Mine. COP was not made aware of the application, either by Castle Valley or the BLM. *Reynolds Dec.* at 10.

On or about November 2, 2011, the BLM issued a decision, approving Castle Valley's request. That decision was appealed and assigned appeal number IBLA-2012-0039. COP first learned of Castle Valley's application and the decision when the Office of the Regional Solicitor submitted a copy of the decision in IBLA 2011-111 and -112 (consolidated) on or about November 8, 2011, and served a copy on counsel for COP. *Reynolds Dec.* at 10.

On or about September 27, 2011, Castle Valley submitted another request for modification of the R2P2. COP was not aware of that request, nor the resulting BLM Decision issued on November 17, 2011, which is the subject of the present appeal. *Reynolds Dec.* at 11.

COP appeals the BLM Decision, based primarily on the fact that as a landowner and Federal lessee, it is entitled to certain due process rights with respect to the Mine. Those rights are being completely ignored by Castle Valley and the BLM, as decisions are made—without notice to COP--concerning the Mine and the R2P2, decisions that have potential economic impact upon COP and its property rights and obligations. COP has identified similar due process violations in its other recent appeals related to the Mine and the operation of Castle Valley, and it appears that Castle Valley and the BLM continue to make critical decisions with respect to the Mine and the mining process that impact COP, without providing basic due process: the right to notice and a hearing. As such, COP seeks a stay of the BLM Decision pending this appeal in order to remedy that violation of its due process rights.

II. ARGUMENT: THE BLM DECISION SHOULD BE STAYED PENDING APPEAL.

Pursuant to governing regulations, a stay is appropriate when the appellant can demonstrate:

> (i) The relative harm to the parties if the stay is granted or denied,
>
> (ii) The likelihood of the appellant's success on the merits,
>
> (iii) The likelihood of immediate and irreparable harm if the stay is not granted, and
>
> (iv) Whether the public interest favors granting the stay...

43 C.F.R. § 4.21. In the present case, all four elements are satisfied. The following sections elaborate.[1]

A. COP is Likely to Succeed on the Merits of its Appeal

1. COP has substantial property interest in the Mine and the Coal Leases. The BLM Decision was issued without notice to COP and, therefore, in violation of its due process rights.

The thrust of COP's appeal is that the BLM Decision, as well as the January 7 Decision and other decisions related to the modification of the R2P2, were issued in violation of COP's due process rights and should therefore be reversed. As the following paragraphs illustrate, COP has a high likelihood of prevailing on that point in this appeal because, although it has genuine and valuable property interests at stake, it was deprived notice and an opportunity for a hearing

[1] While they are not presented in numerical order, the following discussion addresses each element of Section 4.21 in a logical fashion.

related to those property interest and was, therefore, completely excluded from the decision-making process.

The fundamental, constitutional concept of "due process of law" mandates that property interests will not be deprived—or even "negatively affected by governmental actors" without providing proper notice and "pre-deprivation hearing." *See Marcus v. McCollum*, 394 F.3d 813, 818 (10th Cir. 2004). The government cannot—or at least should not—negatively impact property interests without those basic requirements of notice and a hearing.

In the present case, COP is the owner of fee coal within the LMU – including coal in the Tank Seam and Hiawatha Seam. Further, COP is the primary Federal coal lessee in the LMU. While Castle Valley may be the current operator of the Mine, that will not last forever. The Operating Agreement under which Castle Valley derives its putative rights to operate the Mine (as transferred from the CWM Trustee) will expire, by its own terms, in 2022. If Castle Valley defaults, its rights may terminate sooner. In any event, the right to mine the coal from the Mine will revert back to COP. COP therefore has a vested interest to ensure that mining is carried out in the most effective and efficient manner possible, focusing on MER and minimizing, as much as possible, the amount of coal that may be abandoned in the Mine through a particular mining method. *(See various regulations, infra).*

While Castle Valley and BLM may characterize the BLM Decision as a "minor modification," that description is really beside the point. They may argue that the result of the Decision cannot possibly affect COP's property interests. Again, that is beside the point. The point is that applications have been made for modification to the mining methodology without

notice to COP and an opportunity for COP to evaluate how it may affect its property interests. And as Mr. Reynolds testifies in his Declaration in support of this Petition, the proposed changes in mining layout have significant potential impact on COP. *Reynolds Dec.* at 13 (discussed more fully below). Further, as COP points out in its Statement of Reasons in IBLA Appeal 2011-112, the modification to the R2P2, generally, does *not* capitalize upon or ensure MER and negatively impacts COP's property rights. The actions of Castle Valley and the BLM are unilateral and fail to provide COP with fundamental due process considerations.

Further, COP, as lessee, remains under a host of obligations under its lease, including royalty obligations. The Federal regulations in Title 43 place the responsibility for mine operations, for "diligent development and continued operation," for payment of royalties, and for other obligations, upon the "operator/lessee" of the mine. *See, e.g.,* 43 C.F.R. §§ 3481.1 and 3483.1 ("Diligent development and continued operation requirement," requiring an "operator/lessee" to achieve and maintain diligent development of Federal coal leases). The consequence for failure to satisfy those obligations, including achieving and maintaining diligence, can be termination of the Federal coal leases. *See* 43 C.F.R. § 3483.2.

In many cases, the operator and lessee are the same entity. The regulations, however, contemplate that they may be distinct entities. *See* 43 C.F.R. § 3480.0-5(a)(27) ("Operator/lessee means lessee, licensee, **and/or** one conducting operations on a Federal lease or license under a written contract or written agreement with the lessee or licensee." Emphasis added). In the present case, they are distinct. COP is the owner of fee coal and the lessee under many of the above-referenced Federal coal leases. COP then subleases to the mine operator—formerly

CWM and now Castle Valley. Under the regulations, however, *both* Castle Valley and COP have obligations, responsibilities, and rights under the Federal coal leases.

Despite the fact that COP is still the lessee under the Federal leases in question and has rights and responsibilities with respect to those leases, Castle Valley filed the request for modification without notice to COP. Likewise, the BLM granted the request but did not give COP the opportunity to present any objections or have a hearing on the matter.

Now, COP is bound by the BLM Decision and by whatever obligations or consequences may arise because of it, including the possible impact on the Federal coal leases and COP's rights thereunder, as well as other rights COP may have. The BLM Decision puts COP in the untenable position of having rights and responsibilities under the Federal coal leases but no voice in decisions involving those leases.

Simply stated, Castle Valley, as an operator and sublessee, cannot undertake to modify or alter those leases with the BLM without at least notice to COP. To exclude COP from that process is a violation of not only due process but also fundamental contract principles. It is tantamount to an unconstitutional taking. It warrants a stay and, ultimately, the reversal of the BLM Decision so the process can be conducted fairly.

2. The Sale Order from the Bankruptcy Court, contrary to the Board's conclusion in Appeal 2011-112, actually provides for COP's participation in the R2P2 determination process.

In its Order denying COP's Petition for Stay in Appeal 2011-112, the Board made reference to Findings of Fact and Conclusions of Law entered by the Bankruptcy Court in the context of the Trustee's motion to sell to Castle Valley the right to mine under the COP

Operating Agreement. The Board cites one comment from those Findings and Conclusions where the Bankruptcy Court indicates that COP would not have "veto power" over any R2P2 applications submitted by Castle Valley. The Board interprets that statement as meaning that COP would have no right to notice of any proposed modifications and no right to even participate in the application process or decision-making. This interpretation is overbroad, incorrect, and does not address the full scope of Bankruptcy Court's ultimate decisions embodied in the Sale Order (Tab 2). After the entry of the Findings and Conclusions, the Trustee proposed a detailed Sale Order. Objections were filed (by COP and others) and a hearing was held to address those objections. (*See Transcript*, Tab 3). In its objection to the proposed order, COP suggests that paragraph 10(a) contain language permitting COP to participate in legitimate proceedings before federal agencies with respect to the R2P2. (*Transcript, at 8.*). In response, the Court simply clarifies that it will listen to the party's concerns and objections and ultimately make its own determination as to the language of the order. (*Transcript, at p. 9.*)

The hearing on the objections was conducted on August 3, 2010. On August 4, 2010, the Court entered the Sale Order. The court revised paragraph 10 from the version of the Sale Order proposed by the Trustee, taking COP's objections into account, and ultimately ordered as follows:

> COP has no veto power or other right of control as to the contents or approval of updated resource recovery and protection plans ("R2P2's"). *"Nothing in this Order shall be interpreted to prevent any party from participating in any proceeding related to the R2P2 or amendments."*

(*Sale Order (Tab 2) at p. 4*, emphasis added).

The import of this language is clear. While COP agrees that it may not "veto" a proposed R2P2, it certainly has the right, as ordered by the Bankruptcy Court, to participate in any proceedings before the BLM related to the R2P2 or its amendments or modifications. It has a right to have its objections voiced and heard. It has a right to be advised and notified of proposed modifications that affect its property rights. It has a right to express to the BLM the concerns, as a property holder, of potential impact the BLM's decisions might have on those property interests. The Sale Order clearly does not preclude COP from participation. The Bankruptcy Court, after hearing COP's Objection, specifically included language in the Order that would protect those rights. Castle Valley and the BLM have completely ignored those same rights that the Bankruptcy Court took such pains to protect. That willful exclusion of COP is in derogation of COP's constitutional due process rights and cannot be countenanced.[2]

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[2] In that same Order, the Board cited to *Exxon Co., USA*, 156 IBLA 387, 400 n.9 (2002) to support its conclusion that no notice was necessary to COP and that no regulations had been cited requiring it. The footnote from *Exxon* reads as follows: "Although Exxon argues that MMS was obligated to communicate with Exxon, as lessee, not just Shell, concerning lease matters, Exxon's designation of Shell as the operator of affected portion of lease OCS-G 4733, as well as of the proposed High Island Block A-6 Unit, authorized Shell to act on Exxon's behalf regarding the lease and unit."

The *Exxon* case is distinct from the present case in at least one important way. Here, Castle Valley may be the operator, but they are certainly not the designee of COP. Castle Valley purchased the right to Mine from the Trustee, but COP strenuously objected. Under the facts and circumstances of this arrangement, it cannot possibly be asserted that Castle Valley was authorized to act on behalf of COP with respect to the Mine. The question of whether specific regulations require notice to COP is irrelevant because the Constitution requires it. Fundamental principles of fairness also require it. COP is an entity with a property interest affected by the application and the potential decision. It is a question of due process, rather than specific regulatory requirements.

B. Absent a Stay Of The BLM Decision, The Harm To COP Will Be Irreparable and Clearly More Detrimental to COP than any Potential Harm to Castle Valley from a Stay.

The next two elements of Section 4.12 can be combined: The harm to COP would be irreparable if no stay is granted; and the balance of harms weighs in favor of COP.

Significantly, the harm at issue here is not just the harm from the specific change requested by Castle Valley in the context of the BLM decision; the harm extends to the violations of COP's due process rights and other property rights generally arising out of the approval of the R2P2 modification requested and completed without COP's notice or involvement.

The harm to COP that arises from the modification to the R2P2, generally, is outlined fully in COP's other appeal before the Board, IBLA Appeal 2011-112, and is set forth in the Declaration of Charles Reynolds filed in that appeal, a copy of which is attached at Tab 5. Specifically, it is COP's position that the proposed modifications jeopardize MER, result in less efficient mining practices, potentially abandon significant amounts of coal in the mine, and generally jeopardize the remaining coal reserves.[3]

If Castle Valley is permitted to proceed in the method they have proposed, in both the original R2P2 modification and this recent "minor" modification, the irreparable harm to COP will be devastating. The BLM suggests that it has expert reports that indicate that the retreat mining method will have no significant impact on stresses, the ability to continue with multiple

[3] To avoid needless repetition, the arguments in IBLA Appeal 2011-112 are specifically incorporated herein, without reproducing them. The facts set forth in the prior Declaration of Mr. Reynolds are also expressly incorporated, by this reference.

seam mining, and the compatibility with long-wall mining. This is not accurate. The application by Castle Valley appears to rely, at least in part, upon the theory that previous multiple-seam retreat mining was successful in the Mine. As Mr. Reynolds testifies, based on his years of experience with the Mine, that is not accurate. Previously, some reserves were lost in the bottom seam, due to panel layout in the two seams. The proposed layout in the Tank seam (the upper seam) therefore creates an untenable risk of (a) precluding future longwall mining in the Hiawatha (lower) seam; and (b) consequently abandoning many millions of tons of coal that would now be unrecoverable. Thus, at the end of Castle Valley's lease in 2022, Castle Valley will have abandoned millions of tons coal that could have been recovered using the longwall method. That risk constitutes irreparable harm to COP, as landowner, owner of fee coal, and lessee of Federal Coal.

On the other hand, the only harm that would come to Castle Valley by issuing the stay would be the maintenance of the status quo. In other words, they would suffer no harm. Castle Valley would continue mining as they have been.

This issue may ultimately be decided in Castle Valley's favor. But it is far more important for this tribunal to honor COP's due process rights and provide COP with notice, opportunity for hearing, and a meaningful opportunity to participate in the decision-making process that relates to—and possibly negatively impacts—their substantial property rights. Thus, the principal harm to COP is the injury to their due process rights, which weighs substantially more in the judicial scales than whatever harm Castle Valley could possibly suggest from continuing its operations without these current modifications. COP simply seeks a seat at the

table, so to speak, as is its constitutional right. To allow this decision to "go live" would do irreparable damage to those rights—not to mention the substantial risk to COP's property rights. The only way to avoid that constitutional injury is to stay the effectiveness of the BLM decision, reverse it, then address it again, giving COP the opportunity to participate in the process.

C. The Granting Of the Stay Is Consistent With Public Interest.

While often the least considered element in this context (or related injunctive relief), perhaps the clearest element in this case is the fact that the issuance of the stay is entirely consistent with public interest.

To allow an administrative decision to proceed when the decision was obtained in violation of constitutional due process rights is problematic on a public scale because it dilutes everyone's due process rights. Federal courts generally hold that preventing a violation of due process (even in the similar context of injunctive relief), is an important public interest. *See Allstates Humane Game Fowl Organization, Inc. v. City of Jacksonville,* 2008 WL 2949442, *13 (M.D. Fla. 2008) ("The public interest in maintaining due process is considerable and has been clearly established. To deny the injunction would allow the Defendants to violate Plaintiffs' basic freedoms enjoyed under the Constitution.").

This result is intuitive and almost goes without saying. The citizenry is interested in seeing that constitutional rights are preserved, even if it means an inconvenience to others by staying the effectiveness of a decision. Those constitutional rights—in the public eye—are paramount to any interest that Castle Valley might have in proceeding forward with mining activities in the method they desire. Castle Valley's request does not ostensibly involve a

question of mine safety or any benefit to the public other than its own economic interest. The constitutional interests of COP in assuring that the process is carried out correctly is significantly more important and consistent with public interest.

Thus, the stay is consistent with the public interest and should be granted.

CONCLUSION

Having satisfied all elements of Section 4.21, COP, therefore, has established its entitlement to a stay of the BLM decision.

DATED this 15th day of December, 2011.

SNOW, CHRISTENSEN & MARTINEAU

Kim R. Wilson (Utah State Bar 3512)
David L. Pinkston (Utah State Bar 6630)
P. Matthew Cox (Utah State Bar 9879)
Attorneys for COP Coal Development Company
10 Exchange Place, Eleventh Floor
P.O. Box 45000
Salt Lake City, UT 84145
(801) 521-9000

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Office of Hearing and Appeals
801 North Quincy St., Suite 300
Arlington, VA 22203
Fax: (703) 235-8349
(*Via Certified Mail*)

Michael Zundel
PRINCE, YEATES & GELDZAHLER
15 West South Temple, Suite 1700
Salt Lake City, UT 84101-1549
(*Via Certified Mail*)

Lawrence J. Jensen, Regional Solicitor
John Steiger, Deputy Regional Solicitor
U.S. Department of the Interior
Office of the Regional Solicitor
Salt Lake City Intermountain Region
6201 Federal Bldg.
125 S. State Street
Salt Lake City, UT 84138-1180
(*Via Certified Mail*)

U.S. Department of Interior
Bureau of Land Management
Utah State Office
440 West 200 South, Suite 500
Salt Lake City, UT 84101
(*Original hand delivered)*
(*Copy, via Certified Mail*)

George Hofmann
PARSONS KINGHORN HARRIS, PC
111 East Broadway, Suite 1100
Salt Lake City, UT 84111
(*Via Certified Mail*)

A. John Davis, III
HOLME ROBERTS & OWEN, LLP
299 South Main Street, Suite 1800
Salt Lake City, UT 84111
(*Via Certified Mail*)

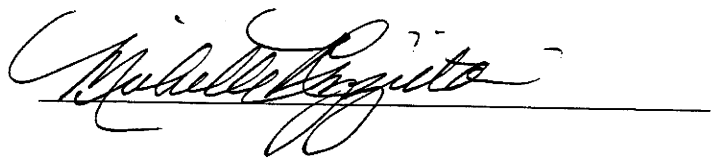
Corey Heaps
CASTLE VALLEY MINING LLC
2352 North 7th Street, Unit B
Grand Junction, CO 81501
(*Via Certified Mail*)

Kenneth A. Rushton
P.O. Box 212
Lehi, UT 84043
(*Via Certified Mail*)

Utah Division of Oil Gas & Mining
1594 West North Temple, Suite 1210
Salt Lake City, UT 84114-5801
(*Via Certified Mail*)

ANR Company, Inc.
3212 South State Street
Salt Lake City, UT 84115
(*Via Certified Mail*)

David E. Kingston
3212 South State Street
Salt Lake City, UT 84115
(*Via Certified Mail*)



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K

KIM R. WILSON, Utah State Bar No. 3512
DAVID L. PINKSTON, Utah State Bar No. 6630
SCOTT H. MARTIN, Utah State Bar No. 7750
P. MATTHEW COX, Utah State Bar No. 9879
SNOW, CHRISTENSEN & MARTINEAU
10 Exchange Place, Eleventh Floor
Post Office Box 45000
Salt Lake City, Utah 84145-5000
Telephone: (801) 521-9000
Facsimile: (801) 363-0400
Attorneys for COP Coal Development Company

UNITED STATES DEPARTMENT OF THE INTERIOR
OFFICE OF HEARINGS AND APPEALS
INTERIOR BOARD OF LAND APPEALS

COP COAL DEVELOPMENT COMPANY, Appellant. (Appeal of November 2, 2011 BLM decision approving Minor Modification of R2P2, Castle Valley Mine No. 3 and No. 4)	IBLA _____ **PROOF OF SERVICE** **[Oral argument requested]** 3482 (UTG 023) UTU-73342 (LMU) U-020668 (Lead Coal Lease)

Attached, please find proof of certified mailing of the Appellant C.O.P. Coal Development Company's Notice of Appeal.

DATED this 15 day of December, 2011.

SNOW, CHRISTENSEN & MARTINEAU

Kim R. Wilson (Utah State Bar 3512)
David L. Pinkston (Utah State Bar 6630)
Scott H. Martin (Utah State Bar 7750)
P. Matthew Cox (Utah State Bar 9879)
Attorneys for COP Coal Development Company
10 Exchange Place, Eleventh Floor
P.O. Box 45000
Salt Lake City, UT 84145
(801) 521-9000

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I HEREBY CERTIFY, that on the 15th day of December, 2011, a true and correct copy of the foregoing **PROOF OF SERVICE,** was sent via first class mail to the following:

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Office of Hearing and Appeals
Interior Board of Land Appeals
801 North Quincy St., MS 300-QC
Arlington, VA 22203
(*Via FedEx*)

Michael Zundel
PRINCE, YEATES & GELDZAHLER
15 West South Temple, Suite 1700
Salt Lake City, UT 84101-1549

Lawrence J. Jensen, Regional Solicitor
John Steiger, Deputy Regional Solicitor
U.S. Department of the Interior
Office of the Regional Solicitor
6201 Federal Bldg.
125 S. State Street
Salt Lake City, UT 84138-1180

U.S. Department of Interior
Bureau of Land Management
Utah State Office
440 West 200 South, Suite 500
Salt Lake City, UT 84101

George Hofmann
PARSONS KINGHORN HARRIS, PC
111 East Broadway, Suite 1100
Salt Lake City, UT 84111

A. John Davis, III
HOLME ROBERTS & OWEN, LLP
299 South Main Street, Suite 1800
Salt Lake City, UT 84111

Corey Heaps
CASTLE VALLEY MINING LLC
2352 North 7th Street, Unit B
Grand Junction, CO 81501

Kenneth A. Rushton
P.O. Box 212
Lehi, UT 84043

Utah Division of Oil Gas & Mining
1594 West North Temple, Suite 1210
Salt Lake City, UT 84114-5801

ANR Company, Inc.
3212 South State Street
Salt Lake City, UT 84115

David E. Kingston
3212 South State Street
Salt Lake City, UT 84115

Michelle Rizzuto

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John Steiger, Deputy Regional Solicitor
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Office of the Regional Solicitor
6201 Federal Bldg.
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Salt Lake City, UT 84138-1180

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George Hofmann
PARSONS KINGHORN HARRIS, PC
111 East Broadway, Suite 1100
Salt Lake City, UT 84111

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Utah Division of Oil Gas & Mining
1594 West North Temple, Suite 1210
Salt Lake City, UT 84114-5801

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A. Signature
X ☐ Agent ☐ Addressee

B. Received by (Printed Name) | C. Date of Delivery

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

Received
DEC 05 2011
State Mail & Distribution Svcs

3. Service Type
☐ Certified Mail ☐ Express Mail
☐ Registered ☐ Return Receipt for Merchandise
☐ Insured Mail ☐ C.O.D.

4. Restricted Delivery? (Extra Fee) ☐ Yes

2. Article Number (Transfer from service label) 7011 0110 0000 3836 2218

PS Form 3811, February 2004 Domestic Return Receipt 102595-02-M-1540

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3. Also complete item 4 if Restricted Delivery is desired.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

David E. Kingston
3212 South State Street
Salt Lake City, UT 84115

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X LeeAnn Lee Kingston ☐ Agent ☐ Addressee

B. Received by (Printed Name) KINGSTON | C. Date of Delivery

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☐ Certified Mail ☐ Express Mail
☐ Registered ☐ Return Receipt for Merchandise
☐ Insured Mail ☐ C.O.D.

4. Restricted Delivery? (Extra Fee) ☐ Yes

2. Article Number (Transfer from service label) 7011 0110 0000 3836 2249

PS Form 3811, February 2004 Domestic Return Receipt 102595-02-M-1540

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3. Also complete item 4 if Restricted Delivery is desired.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

MICHAEL ZUNDEL
PRINCE YEATES & GELDZAHLER
15 W SOUTH TEMPLE #1700
SALT LAKE CITY UT 84101-1549

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X ☐ Agent ☐ Addressee

B. Received by (Printed Name) | C. Date of Delivery

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☒ Certified Mail ☐ Express Mail
☐ Registered ☐ Return Receipt for Merchandise
☐ Insured Mail ☐ C.O.D.

4. Restricted Delivery? (Extra Fee) ☐ Yes

2. Article Number (Transfer from service label) 7009 3410 0002 2333 4443 25935.3

PS Form 3811, February 2004 Domestic Return Receipt 102595-02-M-1540

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3. Also complete item 4 if Restricted Delivery is desired.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

U.S. Department of Interior
Bureau of Land Management
Utah State Office
440 West 200 South, Suite 500
Salt Lake City, UT 84101

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X Laurie Talbot ☐ Agent ☐ Addressee

B. Received by (Printed Name) Laurie Talbot
C. Date of Delivery 12-5-11

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☐ Certified Mail ☐ Express Mail
☐ Registered ☐ Return Receipt for Merchandise
☐ Insured Mail ☐ C.O.D.

4. Restricted Delivery? (Extra Fee) ☐ Yes

2. Article Number (Transfer from service label) 7011 0110 0000 3836 2232

PS Form 3811, February 2004 Domestic Return Receipt 102595-02-M-1540

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3. Also complete item 4 if Restricted Delivery is desired.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

A. John Davis, III
HOLME ROBERTS & OWEN, LLP
299 South Main Street, Suite 1800
Salt Lake City, UT 84111

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X ☐ Agent ☐ Addressee

B. Received by (Printed Name)
C. Date of Delivery DEC - 5 2011

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☐ Certified Mail ☐ Express Mail
☐ Registered ☐ Return Receipt for Merchandise
☐ Insured Mail ☐ C.O.D.

4. Restricted Delivery? (Extra Fee) ☐ Yes

2. Article Number (Transfer from service label) 7011 0110 0000 3836 2263

PS Form 3811, February 2004 Domestic Return Receipt 102595-02-M-1540

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3. Also complete item 4 if Restricted Delivery is desired.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Kenneth A. Rushton
Box 212
Lehi, UT 84043

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X ☐ Agent ☐ Addressee

B. Received by (Printed Name) KEITH RUSHTON
C. Date of Delivery 12-7-11

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☐ Certified Mail ☐ Express Mail
☐ Registered ☐ Return Receipt for Merchandise
☐ Insured Mail ☐ C.O.D.

4. Restricted Delivery? (Extra Fee) ☐ Yes

2. Article Number (Transfer from service label) 7011 0110 0000 3836 2287

PS Form 3811, February 2004 Domestic Return Receipt 102595-02-M-1540

SENDER: *COMPLETE THIS SECTION*

- Complete items 1, 2, and 3. Also complete item 4 if Restricted Delivery is desired.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

ANR Company, Inc.
3212 South State Street
Salt Lake City, UT 84115

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X [signature] ☐ Agent ☐ Addressee

B. Received by *(Printed Name)*
KINGSTON

C. Date of Delivery

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☐ Certified Mail ☐ Express Mail
☐ Registered ☐ Return Receipt for Merchandise
☐ Insured Mail ☐ C.O.D.

4. Restricted Delivery? *(Extra Fee)* ☐ Yes

2. Article Number
(Transfer from service label) 7011 0110 0000 3836 2225

PS Form 3811, February 2004 Domestic Return Receipt 102595-02-M-1540

C/015/025 Incoming

K

KIM R. WILSON, Utah State Bar No. 3512
DAVID L. PINKSTON, Utah State Bar No. 6630
SCOTT H. MARTIN, Utah State Bar No. 7750
P. MATTHEW COX, Utah State Bar No. 9879
SNOW, CHRISTENSEN & MARTINEAU
10 Exchange Place, Eleventh Floor
Post Office Box 45000
Salt Lake City, Utah 84145-5000
Telephone: (801) 521-9000
Facsimile: (801) 363-0400
Attorneys for COP Coal Development Company

UNITED STATES DEPARTMENT OF THE INTERIOR
OFFICE OF HEARINGS AND APPEALS
INTERIOR BOARD OF LAND APPEALS

COP COAL DEVELOPMENT COMPANY, Appellant. (Appeal of November 17, 2011 BLM decision approving Minor Modification of R2P2, Castle Valley Mine No. 4)	IBLA _____ **DECLARATION OF CHARLES REYNOLDS IN SUPPORT OF PETITION FOR STAY PENDING APPEAL (43 C.F.R. 4.21)** **[Oral argument requested]** 3482 (UTG 023) UTU-73342 (LMU) U-020668 (Lead Coal Lease)

CHARLES REYNOLDS, being first duly sworn, upon oath and upon penalty of perjury, declares as follows:

1. I am over 18 years of age and have personal knowledge of the facts set forth herein, except as to those matters that are stated on information and belief.

2. Prior to its involuntary bankruptcy, I was the President of C.W. Mining ("CWM").

3. I received a bachelor's degree from the University of Utah in mining engineering. I have been involved in mining and mining operations since 1991:

a. From 1991 to 2001, I was the Chief Mining Engineer of CWM.

b. From 2001 to 2004, I was the Human Resource Manager for CWM; and

c. From 2004 to 2008, I was the Mine Manager, managing all aspects of the mining operation for CWM.

4. I have been involved in every aspect of the operation of the Mine since 2004 through at least the end of 2007. I hold a current professional engineer ("PE") license from the State of Utah, as well as mine Fireboss certification.

5. I am a consultant to C.O.P. Coal Development Company, ("COP"), the appellant herein, and the scope of my responsibilities include the Bear Canyon Mine or, as identified in the BLM Decision (defined below), Castle Valley No. 3 and No. 4 Mines (the "Mine"). I am authorized by COP to make this Declaration.

6. I am aware that in January, 2008, an involuntary bankruptcy case was commenced against C.W. Mining Company ("CWM"), in the United States Bankruptcy Court for the District of Utah, Case no. 08-20105, and that Kenneth A. Rushton was ultimately appointed Chapter 7 Trustee (the "Trustee").

7. COP is the fee owner of certain real property within the Bear Canyon Logical Mining Unit (LMU) UTU-73342, including the property on which the Mine is located. COP is also the fee owner of certain coal and is the lessee under various Federal coal leases related to coal owned by the United States Department of the Interior, Bureau of Land Management ("BLM"), some of which leases are identified below.

8. In March of 1997, COP and CWM entered into a "Coal Operating Agreement", whereby COP granted to CWM the right "to operate and control" the Mine for purposes reasonably incidental to mining for a period of 25 years. I am aware that in CWM's bankruptcy case, the Trustee purported to sell CWM's rights under the Coal Operating Agreement to Castle Valley Mining, LLC ("Castle Valley"), the applicant in this matter. COP and others objected to the proposed sale, and a multi-day trial was conducted in the bankruptcy court.

9. I am informed that on or about December 14, 2010, the BLM (Utah State Office) received an R2P2 modification request from Castle Valley, related to the Mine. I am also aware that on January 7, 2011, the BLM (Utah State Office) issued a decision approving the requested modification and that COP has appealed that decision, raising a number of substantive disputes with the BLM's rationale, as well as concerns about violation of COP's due process rights. Castle Valley's requested modification was approved without notice to COP and without its input, approval, or consent.

10. I have been informed that on or about July 29, 2011, Castle Valley submitted a revised mine plan for the Mine, seeking a modification to the R2P2, affecting the mining layout and timing of the continuous miner sections in certain coal areas and leases in the "Tank Seam" of the Mine. COP was not made aware of the application, either by Castle Valley or the BLM, at

the time it was filed. Likewise, COP was not made aware of the decision of the Price Office of the BLM, approving that request, issued on November 2, 2011 until COP's counsel received a copy from the Regional Solicitor's office, which copy was served November 8, 2011.

11. I am aware that Castle Valley submitted another request for modification on or about September 27, 2011. COP was not made aware of that request at the time. I am also aware that the BLM issued a decision approving that request on or about November 17, 2011 (the "BLM Decision"). I have reviewed the BLM Decision.

12. These decisions related to the Mine and the R2P2 have potential direct economic impact on COP, as landowner and as Federal lessee under the coal leases. COP has certain obligations—and rights--with respect to those leases, the coal, and the land. The modifications approved by the BLM will impact those obligations and rights, even though COP has been entirely excluded from the decision-making process.

13. Further, the application by Castle Valley, upon which the BLM Decision is based, appears to rely, at least in part, upon the theory that previous multiple-seam retreat mining was successful in the Mine. But that is not necessarily true. Previously, some reserves were lost in the bottom seam, due to panel layout in the two seams. Based on my experience, the proposed layout in the Tank seam (the upper seam) creates a risk of precluding future longwall mining in the Hiawatha (lower) seam, and accordingly, the risk of abandoning many millions of tons of coal that would now be unrecoverable. I attempted, recently, to review the BLM files and expert reports at the BLM office in Salt Lake City, related to the modification request. I was denied access to those files.

14. I declare under penalty of perjury that the foregoing is true and correct.

EXECUTED this 15th day of December, 2011.

CHARLES REYNOLDS

CERTIFICATE OF SERVICE

I HEREBY CERTIFY, that on the __ day of December, 2011, a true and correct copy of the foregoing was delivered as noted below, in accordance with the applicable rules, to the following:

Interior Board of Land Appeals
Office of Hearing and Appeals
801 North Quincy St., Suite 300
Arlington, VA 22203
Fax: (703) 235-8349
(Via Certified Mail)

Michael Zundel
PRINCE, YEATES & GELDZAHLER
City Centre I, Suite 900
175 East 400 South
Salt Lake City, UT 84111-2314
(Via Certified Mail)

Lawrence J. Jensen, Regional Solicitor
John Steiger, Deputy Regional Solicitor
U.S. Department of the Interior
Office of the Regional Solicitor
Salt Lake City Intermountain Region
6201 Federal Bldg.
125 S. State Street
Salt Lake City, UT 84138-1180
(Via Certified Mail)

U.S. Department of Interior
Bureau of Land Management
Utah State Office
440 West 200 South, Suite 500
Salt Lake City, UT 84101
(via Certified Mail)

George Hofmann
PARSONS KINGHORN HARRIS, PC
111 East Broadway, Suite 1100
Salt Lake City, UT 84111
(Via Certified Mail)

A. John Davis, III
HOLME ROBERTS & OWEN, LLP
299 South Main Street, Suite 1800
Salt Lake City, UT 84111
(Via Certified Mail)

Corey Heaps
CASTLE VALLEY MINING LLC
2352 North 7th Street, Unit B
Grand Junction, CO 81501
(Via Certified Mail)

Kenneth A. Rushton
P.O. Box 212
Lehi, UT 84043
(Via Certified Mail)

Utah Division of Oil Gas & Mining
1594 West North Temple, Suite 1210
Salt Lake City, UT 84114-5801
(Via Certified Mail)

ANR Company, Inc.
3212 South State Street
Salt Lake City, UT 84115
(Via Certified Mail)

David E. Kingston
3212 South State Street
Salt Lake City, UT 84115

(*Via Certified Mail*)

Form 1842-1
(September 2006)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

INFORMATION ON TAKING APPEALS TO THE INTERIOR BOARD OF LAND APPEALS

DO NOT APPEAL UNLESS
1. This decision is adverse to you,
AND
2. You believe it is incorrect

IF YOU APPEAL, THE FOLLOWING PROCEDURES MUST BE FOLLOWED

1. NOTICE OF APPEAL

A person who wishes to appeal to the Interior Board of Land Appeals must file in the office of the officer who made the decision (not the Interior Board of Land Appeals) a notice that he wishes to appeal. A person served with the decision being appealed must transmit the *Notice of Appeal* in time for it to be filed in the office where it is required to be filed within 30 days after the date of service. If a decision is published in the FEDERAL REGISTER, a person not served with the decision must transmit a *Notice of Appeal* in time for it to be filed within 30 days after the date of publication (43 CFR 4.411 and 4.413).

2. WHERE TO FILE

NOTICE OF APPEAL.....
BUREAU OF LAND MANAGEMENT
GREEN RIVER DISTRICT, PRICE FIELD OFFICE
125 SOUTH 600 WEST
PRICE, UTAH 84501

WITH COPY TO SOLICITOR...
DEPARTMENT OF THE INTERIOR
OFC OF THE REGIONAL SOLICITOR
6201 FEDERAL BUILDING - 125 SOUTH STATE STREET
SALT LAKE CITY, UTAH 84138-1180

3. STATEMENT OF REASONS

Within 30 days after filing the *Notice of Appeal*, file a complete statement of the reasons why you are appealing. This must be filed with the United States Department of the Interior, Office of Hearings and Appeals, Interior Board of Land Appeals, 801 N. Quincy Street, MS 300-QC, Arlington, Virginia 22203. If you fully stated your reasons for appealing when filing the *Notice of Appeal*, no additional statement is necessary (43 CFR 4.412 and 4.413).

WITH COPY TO SOLICITOR.....
DEPARTMENT OF THE INTERIOR
OFC OF THE REGIONAL SOLICITOR
6201 FEDERAL BUILDING - 125 SOUTH STATE STREET
SALT LAKE CITY, UTAH 84138-1180

4. ADVERSE PARTIES.....

Within 15 days after each document is filed, each adverse party named in the decision and the Regional Solicitor or Field Solicitor having jurisdiction over the State in which the appeal arose must be served with a copy of: (a) the *Notice of Appeal*, (b) the Statement of Reasons, and (c) any other documents filed (43 CFR 4.413).

5. PROOF OF SERVICE.....

Within 15 days after any document is served on an adverse party, file proof of that service with the United States Department of the Interior, Office of Hearings and Appeals, Interior Board of Land Appeals, 801 N. Quincy Street, MS 300-QC, Arlington, Virginia 22203. This may consist of a certified or registered mail "Return Receipt Card" signed by the adverse party (43 CFR 4.401(c)).

6. REQUEST FOR STAY.....

Except where program-specific regulations place this decision in full force and effect or provide for an automatic stay, the decision becomes effective upon the expiration of the time allowed for filing an appeal unless a petition for a stay is timely filed together with a *Notice of Appeal* (43 CFR 4.21). If you wish to file a petition for a stay of the effectiveness of this decision during the time that your appeal is being reviewed by the Interior Board of Land Appeals, the petition for a stay must accompany your *Notice of Appeal* (43 CFR 4.21 or 43 CFR 2801.10 or 43 CFR 2881.10). A petition for a stay is required to show sufficient justification based on the standards listed below. Copies of the *Notice of Appeal* and Petition for a Stay must also be submitted to each party named in this decision and to the Interior Board of Land Appeals and to the appropriate Office of the Solicitor (43 CFR 4.413) at the same time the original documents are filed with this office. If you request a stay, you have the burden of proof to demonstrate that a stay should be granted.

Standards for Obtaining a Stay. Except as otherwise provided by law or other pertinent regulations, a petition for a stay of a decision pending appeal shall show sufficient justification based on the following standards: (1) the relative harm to the parties if the stay is granted or denied, (2) the likelihood of the appellant's success on the merits, (3) the likelihood of immediate and irreparable harm if the stay is not granted, and (4) whether the public interest favors granting the stay.

Unless these procedures are followed, your appeal will be subject to dismissal (43 CFR 4.402). Be certain that all communications are identified by serial number of the case being appealed.

NOTE: A document is not filed until it is actually received in the proper office (43 CFR 4.401(a)). See 43 CFR Part 4, Subpart B for general rules relating to procedures and practice involving appeals.

(Continued on page 2)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

125 SOUTH 600 WEST
PRICE UTAH 84501
OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE, $300

US OFFICIAL MAIL
$300 Penalty
For Private Use

016H26601204
$00.440
11/17/2011
Mailed From 84501
US POSTAGE
Hasler

RECEIVED
NOV 21 2011

ANR COMPANY
3212 SOUTH STATE STREET
SALT LAKE CITY UT 84115

84115$3828 C005

TAB 2

TAB 2

The below described is SIGNED.

Dated: August 04, 2010

R. KIMBALL MOSIER
U.S. Bankruptcy Judge

Note to County Recorders: This Order affects real property described in Exhibit A attached hereto (located in Emery County, Utah) and Exhibit C attached hereto (located in Carbon County and Emery County, Utah).

Note to Utah Division of Corporations and Commercial Code: This Order affects financing statements described on pages 20, 22 and 23.

IN THE UNITED STATES BANKRUPTCY COURT
FOR THE DISTRICT OF UTAH
Central Division

In re C. W. MINING COMPANY, dba Co-Op Mining Company, Debtor.	Bankruptcy Case No. 08-20105 RKM (Chapter 7) [Filed Electronically]

ORDER AUTHORIZING SALE OF MINE ASSETS FREE AND CLEAR OF ALL LIENS, CLAIMS, ENCUMBRANCES, AND INTERESTS AND AUTHORIZING THE ASSUMPTION AND ASSIGNMENT OF EXECUTORY CONTRACTS UNDER 11 U.S.C. §§ 363 AND 365

Kenneth A Rushton, Chapter 7 trustee (the "**Trustee**") for C.W. Mining Company, dba Co-Op Mining Company (the "**Debtor**") on May 3, 2010, filed as Dkt No. 1299, the following motions (collectively referred to herein as the "**Sale Motion**"):

1. Trustee's Motion for Additional Findings on Trustee's Motion Requesting Authority to Assume Executory Contracts;

2. Motion for Order Authorizing Assignment of Executory Contracts and Sale of Mine Assets Free and Clear of All Liens, Claims, Interests, and Encumbrances Pursuant to 11 U.S.C. §§ 105, 363 and 365;

3. Motion for Order Requiring Removal from Mine Site Property Owned by Third Parties; and

4. Motion for Determination of Ownership of Property at the Mine Site Pursuant to Prior Order.

The Sale Motion sought the entry of an order pursuant to 11 U.S.C. §§ 105, 363 and 365 and Rules 2002, 6004, 6006 and 9014 of the Federal Rules of Bankruptcy Procedure (the "Bankruptcy Rules") authorizing the Trustee to sell the mine assets of the estate (the "**Estate**"), free and clear of any and all liens, claims, encumbrances, and interests, to Rhino Energy LLC or its designated affiliate ("**Buyer**") pursuant to the terms of that certain "Asset Sale Agreement" with the Buyer dated May 3, 2010 and subsequently amended by a First Amendment dated May 13, 2010 and a Second Amendment dated June 2, 2010 (collectively, the "**Sale Agreement**") and in connection with the Trustee's assumption and assignment of the Debtor's mine operating agreements with C.O.P. Coal Development Company ("**COP**") and ANR Company, Inc. ("**ANR**") pursuant to the Trustee's June 9, 2009 *Motion to Assume Coal Operating Agreements and Certain Related Contracts* (Dkt No. 671) ("**Assumption Motion**").

The Court has entered its separate Findings of Fact and Conclusions of Law (Dkt No. 1490) (the "**Findings and Conclusions**") concerning the Sale Motion pursuant to Bankruptcy Rule 9021. Based on those Findings and Conclusions, **GOOD CAUSE EXISTS FOR ENTRY OF THE FOLLOWING ORDER (the "Order"). IT IS THEREFORE ORDERED, ADJUDGED AND DECREED:**

1. The relief requested in the Sale Motion is granted in its entirety subject to the limitations, terms and conditions contained herein. All objections raised to the Sale Motion that were not resolved or withdrawn are hereby overruled on the merits.

2. Notice of the hearing on the Sale Motion was proper, timely, fair and adequate under the circumstances and complied in all respects with § 102(1) of the Bankruptcy Code and Bankruptcy Rules 2002, 6004, 6006, and 7004.

Assumption and Assignment of the Mine Operating Agreements

3. This Court's previously entered March 2, 2010 *Order Authorizing Sale of Assets Free and Clear of Liens and Interests Pursuant to 11 U.S.C. § 363 and Authorizing Assumption and Assignment of Unexpired Leases Pursuant to 11 U.S.C. § 365* (Dkt No. 1189) ("**First Sale Order**") granted relief the Trustee requested in the Assumption Motion, subject to further orders of this Court.

4. The Assumption Motion is still pending resolution. This Order is a "further order of the Court" as contemplated by the First Sale Order.

5. At issue in the Assumption Motion is the Trustee's request to assume the Coal Operating Agreement between the Debtor and COP (the "**COP Mine Operating Agreement**") and the Coal Operating Agreement between the Debtor and ANR (the "**ANR Mine Operating Agreement**, together with the COP Mine Operating Agreement collectively referred to herein as the "**Mine Operating Agreements**").

6. The Trustee's Assumption Motion is hereby GRANTED, with assumption and assignment contingent upon the closing of the transactions under the Sale Agreement ("**Closing**"), as contemplated herein.

7. If the Closing occurs as contemplated, the Mine Operating Agreements are deemed valid and binding and in full force and effect and assumed by the Trustee as of the date of Closing carried out in accordance with the terms of this Order and the Sale Agreement (the

"**Closing Date**"). If the Closing does not occur pursuant to the Sale Agreement, then the Trustee's Assumption Motion shall be subject to further order of the Court.

8. The only effective documents comprising the COP Mine Operating Agreement are those that are attached as **Exhibit B**. The Bureau of Land Management ("**BLM**") federal coal leases ("**COP Federal Coal Leases**") and real property affected by said COP Mine Operating Agreement are described with particularity in **Exhibit A** attached hereto ("**COP Real Property**").

9. The only effective documents comprising the ANR Mine Operating Agreement are those that are attached as **Exhibit D**. The BLM leases ("**ANR Federal Coal Leases**") and real property affected by said ANR Mine Operating Agreement are described with particularity in **Exhibit C** attached hereto (the "**ANR Real Property**").

10. As of the Closing Date, all defaults under the COP Mine Operating Agreement have been cured (or shall be deemed to have been cured). The COP Mine Operating Agreement is in full force and effect and shall be enforceable in accordance with its terms, as construed by the Court's prior orders and this Order. COP has no veto power or other right of control as to the contents or approval of updated Resource Recovery and Protection Plans ("**R2P2's**"). "Nothing in this Order shall be interpreted to prevent any party from participating in any proceeding related to the R2P2 or amendments."

11. No monetary or other default exists under the ANR Mine Operating Agreement. Alternatively, as of the Closing Date, all defaults, if any, under the ANR Mine Operating Agreement have been cured (or shall be deemed to have been cured). The ANR Mine Operating Agreement is in full force and effect and shall be enforceable in accordance with its terms. With respect to the ANR Mine Operating Agreement:

a. The third unnumbered paragraph in section 5 of the ANR Mine Operating Agreement provides that:

> Operator shall, in the operation and development of the premises, comply with all applicable Federal, State, and local laws, that apply to Operator's mining operation and shall conduct its mining operations and take all actions and perform all duties required to maintain the Federal and State mining permits and approvals relating to the Premises.

The permits and approvals referred to in this paragraph apply only to those that are in the name of the Operator under the ANR Mine Operating Agreement. Accordingly, the Operator under the ANR Mine Operating Agreement has no obligation to satisfy permit requirements under permits held in the name of other parties, including Hiawatha Coal Company, Inc. ("**Hiawatha**"), even if they cover part of the ANR Real Property. Neither the Trustee nor Buyer is required, as part of the assumption and assignment of or as future performance under the ANR Mine Operating Agreement, either: (i) to post a bond for reclamation work that may be required at some future time on the ANR Real Property as a result of prior mining activities by U.S. Fuels; (ii) to perform any reclamation duties arising from prior mining activities by U.S. Fuels; or (iii) to compensate ANR or Hiawatha for the cost of any such reclamation work. To the extent that any reclamation obligations may be imposed on the Debtor or its Estate with respect to the ANR Real Property as a result of Hiawatha's failure to perform its duties under Hiawatha's mining permit (ACT/007/011) (the "**Hiawatha Permit**") issued by the Utah Division of Oil, Gas and Mining ("**DOGM**") affecting both the ANR Real Property and a more extensive area of other real property owned

or leased by ANR in which the Estate has no interest, such obligations do not arise under the ANR Mine Operating Agreement. Neither the Trustee nor the Buyer has any duty to perform any requirement imposed on Hiawatha by DOGM with respect to the Hiawatha Permit.

b. The Trustee's actions relating to BLM's decision to delete 60 acres of property (the "**60-Acre Parcel**") under ANR Federal Coal Lease no. USL-025431, as set forth in the LMU Decision (as defined below) and the Trustee's compliance with BLM regulations governing logical mining units do not constitute a breach or default under the ANR Mine Operating Agreement. ANR is estopped to claim that the Trustee has defaulted under the ANR Mine Operating Agreement by complying with federal regulations requiring exclusion of the 60-Acre Parcel from the LMU in connection with the LMU Decision and Buyer has no obligation to maintain the ANR Federal Coal Lease as it pertains to the 60-Acre Parcel.

c. ANR has no veto power or other right of control as to the contents or approval of updated R2P2's. "Nothing in this Order shall be interpreted to prevent any party from participating in any proceeding related to the R2P2."

d. No permit is required of the Operator with respect to the ANR Real Property under the ANR Mine Operating Agreement until mining activity is to be commenced on such property.

13. To provide additional assurance that the BLM's "continued operation" requirement may be satisfied (thereby satisfying future performance of the Continuous Operations Clauses under the Mine Operating Agreements) if coal production prior to the Closing proves to be inadequate, the Trustee shall hold, in reserve (the "**Continuous Operations**

Reserve"), funds in an amount[1] sufficient to cover advance royalty payments for continuous operation year ("COY") beginning July 1, 2009, and COY beginning July 1, 2010,[2] until such time as the Trustee can demonstrate that the Continuous Operations Reserve is no longer necessary to assure compliance with the BLM's "continued operation" requirement for those years.

14. Subject to the terms of the Sale Agreement and the occurrence of the Closing, the sale and assignment of the interest of the Debtor and the Estate in the Mine Operating Agreements to the Buyer, as provided for or contemplated by the Sale Agreement, be, and hereby is, authorized and approved pursuant to §§ 363 and 365 of the Bankruptcy Code.

15. The Mine Operating Agreements shall be deemed valid and binding and in full force and effect and the interest of Debtor and the Estate therein sold and assigned to the Buyer at the Closing, pursuant to §§ 363 and 365 of the Bankruptcy Code. Upon the Closing, in accordance with §§ 363 and 365 of the Bankruptcy Code, the Buyer shall be fully and irrevocably vested in all right, title, interest and duties of Debtor and the Estate under each Mine Operating Agreement, and shall have all rights and powers of the Debtor thereunder. The Trustee

[1] Per the expert report of Norwest Corporation, Dkt No. 1414 and Exhibit TR 609 (the "**Norwest Report**"), there will be no deficit for royalty payments due for the COY beginning July 1, 2009; therefore, no reserve is necessary for that COY. Per the Norwest Report, the deficit for the COY beginning July 1, 2010 will be 306,700 tons, assuming Buyer produces 200,000 tons of coal in that COY, as testified by Buyer. The 306,700 tons multiplied by an average coal sales price of $26.91 per ton (the sales price per ton used by Charles Reynolds in his expert reports for COP and ANR, Dkt Nos. 1417 and 1418; which price is used solely for calculation of the Continuous Operation Reserve and shall not be binding on any party for any other purpose) multiplied by an 8% royalty due under the COP Federal Coal Leases (assuming all coal is produced from federal lands), yields $660,263.76. Per the Norwest Report and assuming production as testified by Buyer, there will be no deficit for the COY beginning July 1, 2011, therefore no reserve is necessary for that COY. Accordingly, the amount (rounded) of the Continuous Operations Reserve shall be $661,000.00.

[2] The COY periods specified herein are the periods referred to in paragraph 51of the Findings and Conclusions as COY09 and COY10.

shall cooperate with, and take all actions reasonably requested by, the Buyer to effectuate the foregoing.

16. Pursuant to §§ 365(b)(1)(A) and (B) of the Bankruptcy Code and pursuant to the terms and subject to the conditions of this Order and the Sale Agreement, the Trustee shall pay or cause to be paid to, or for the benefit of, the parties to any Mine Operating Agreements the requisite Cure Costs, if any, set forth in Paragraph 35 of this Order (the "**Cure Costs**"). There are no Cure Costs payable to ANR. The Cure Costs are hereby fixed as set forth in this Order, and the non-Debtor parties to the Mine Operating Agreements are forever bound by such determination of Cure Costs.

17. Any provision in any Mine Operating Agreement that purports to declare a breach, default or payment right as a result of an assignment or a change of control in respect of the Debtor is unenforceable, and all Mine Operating Agreements shall remain in full force and effect, subject only to payment of the appropriate Cure Costs, if any. No sections or provisions of any Mine Operating Agreement that purport to provide for additional payments, penalties, charges or other financial accommodations in favor of the non-Debtor party to the Mine Operating Agreements shall have any force and effect with respect to the sale transaction and assignments authorized by this Order, and such provisions constitute unenforceable anti-assignment provisions under § 365(f) of the Bankruptcy Code and/or are otherwise unenforceable under § 365(e) of the Bankruptcy Code, and no assignment of any Mine Operating Agreement pursuant to the terms of the Sale Agreement shall in any respect constitute a default under any Mine Operating Agreement. The non-Debtor party to each Mine Operating Agreement shall be deemed to have consented to such assignment under § 365(c)(1)(B) of the Bankruptcy Code, and the Buyer shall enjoy all of the rights and benefits under each such Mine Operating

Agreement as of the applicable date of assumption and assignment without the necessity of obtaining each such non-Debtor party's written consent to the assumption or assignment thereof.

18. By this Order, the Court makes no determination as to: (a) the scope of the rights being acquired by the Buyer under the COP Mine Operating Agreement and the ANR Mine Operating Agreement with respect to any potential ability to exclude from the properties described therein entities who did not receive notice of the Motion as evidenced by the Trustee's certificate of service on file; (b) appurtenant water issues; or (c) the Trustee's damage claims asserted in the Sixth Claim for Relief in Adversary Proceeding No. 09-02248.

19. The Trustee is authorized to assign to Buyer the Debtor's and Estate's interests in the June 16, 2010 BLM approval letter (Exhibit TR 607) and the June 17, 2010 decision by the BLM (Exhibit TR 610) approving a logical mining unit that covers the property described in the Mine Operating Agreements (collectively, the "**LMU Decision**") and all rights and duties associated therewith. No cure is required for such assignment.

20. At the Closing and pursuant to the Sale Agreement, Buyer shall assume all of the Debtor's obligations under the Mine Operating Agreements, the LMU Decision and any transferred permits (including those described in Paragraphs 26(d) and (e) of this Order) (collectively the "**Permits**") arising from and after the Closing Date. The Debtor, the Trustee and the Estate shall be relieved of any liability for any breach of any of the Mine Operating Agreements, the LMU Decision or the Permits occurring from and after Closing, pursuant to and in accordance with § 365(k) of the Bankruptcy Code.

Approval of Sale

21. The sale of the assets that are described in the Sale Agreement (collectively the "**Mine Assets**"), the terms and conditions of the Sale Agreement (including all schedules and

exhibits affixed thereto), and the transactions contemplated thereby, as modified by this Order, shall be, and hereby are, authorized and approved in all respects.

22. The Mine Assets include, without limitation, the Debtor's and its Estate's right, title and interest in the following: (a) the Mine Operating Agreements; (b) the LMU Decision; (c) the equipment described in **Exhibit E-1** attached hereto (other than the excluded equipment listed in **Exhibit G Revised 7-14-2010** attached hereto); (d) a permit to operate the Mine issued by DOGM; (e) the transferable permits and licenses described in **Exhibit E-2** attached hereto, together with any other transferable permits and licenses that relate to the operation of other Mine Assets, including those relating to the ANR Mine Operating Agreement and the ANR Real Property; (f) safety equipment (self rescuers, lights, instruments and monitors); (g) technical data in hard or electronic form, including mine plans, surveys and engineering, geologic, regulatory (including, but not limited to, federal Mine Safety and Health Administration, DOGM, BLM and Minerals Management Service ["**MMS**"]), environmental and monitoring reports and data; (h) operational computers, software and passwords; (i) all surface facilities and infrastructure, and all underground facilities and infrastructure; (j) mine fans, conveyors, pumps and mine dewatering systems, mine fresh water system, mine monitoring system and mine electrical system; (k) appurtenant water rights, if any; (l) keys to buildings, improvements, vehicles and mobile equipment; (m) the following water rights (the "**Bear Canyon Water Rights**") being purchased by the Trustee from Bear Canyon Mining, LLC ("**Bear Canyon**") pursuant to a Services Agreement and Waiver of Claims (the "**Bear Canyon Agreement**") approved by the Court in its Order at Dkt No. 1363 (the "**Bear Canyon Order**"): (i) 50 shares of class A common stock in Huntington-Cleveland Irrigation Company evidenced by certificate no. A 4498 (the "**Water Shares**") and (ii) temporary change application no. 93-3759 (t36238) approved by

the Utah State Engineer for use of the Water Shares at the Mine, together with (iii) permanent change application no. 93-3759 (a36511) subsequently filed with the Utah State Engineer for use of the Water Shares at the Mine (Bear Canyon shall assign the Bear Canyon Water Rights directly to Buyer at the Closing); and (n) the Hiawatha Improvements described in Paragraph 27 and **Exhibit F Revised 7-14-2010** attached hereto. Based on paragraphs 105-109 of the Findings and Conclusions, the entire parts and supplies inventory described in the Sale Agreement is property of the Estate recovered under 11 U.S.C. § 550 or constitutes "improvements" to the property so recovered within the meaning of 11 U.S.C. § 550(e). In the event of any inconsistency between this Order and the Sale Agreement, the provisions of this Order shall control.

23. The Court incorporates its *Second Amended Order Granting Trustee's Remedy Claim under § 550(a) as Against Hiawatha* in Adversary Proceeding No. 08-02338 (Dkt No. 152), wherein the Court ruled as follows:

> **ORDERED** that the Trustee's § 550(a) claim is GRANTED for recovery of the transferred property rather than its value. The recovered property shall be turned over promptly and without damage beyond normal wear and tear and shall consist of all assets of any kind transferred pursuant to the Hiawatha Purchase Agreement, including any transfers of mere possession. Such assets include every item constituting an "improvement" made thereto within the meaning of 11 U.S.C. § 550(e)(2), all of which are property of the Debtor's estate. The Trustee may sell all of the estate's right, title, and interest in such assets including those improvements. The Court makes no determination at this time as to what specific items of equipment constitute improvements or as to ownership of specific items of equipment allegedly owned by Hiawatha to the extent they do not constitute improvements. With respect thereto, the Court ORDERS the parties to cooperate in good faith to resolve such ownership issues.

The improvements shown on **Exhibit F Revised 7-14-2010** (the "**Hiawatha Improvements**") constitute "improvements." "additions," "changes" or "repairs" to the Mine Assets acquired by

Hiawatha from the Debtor which have been ordered returned to the Estate pursuant to §§ 549 and 550 of the Bankruptcy Code and are property of the Estate, which improvements form part of the Mine Assets.

28. The Mine Assets exclude, among other things, the following assets: (a) the following assets that are described in **Exhibit E-1** attached hereto: "AFAB Lease List / AFAB Leased to CW Mining," "Hiawatha Equipment List", and "Hiawatha Equipment List / AFAB Leased to HCC for CW Mining"; provided, however, that notwithstanding the foregoing, the "#1 belt upgrade" that is described under the heading "Hiawatha Equipment List Excluded from Sale" on **Exhibit E-1** shall be included in, and not excluded from, the Mine Assets; and (b) the assets that are described in **Exhibit G Revised 7-14-2010.**

29. The sale of the Mine Assets and the consideration provided by the Buyer under the Sale Agreement is fair and reasonable and shall be deemed for all purposes to constitute a transfer for reasonably equivalent value and fair consideration under the Bankruptcy Code and any other applicable law.

30. The Buyer is hereby granted and is entitled to all of the protections provided to a good faith buyer under § 363(m) of the Bankruptcy Code. The assignment of the Mine Operating Agreements pursuant to § 365 of the Bankruptcy Code is an indispensable part of a sale of the Mine Assets under this Order and is fully included within the protections given the Buyer under § 363(m).

31. The Trustee is authorized to fully perform under, consummate and implement the terms of the Sale Agreement and the Bear Canyon Agreement together with any and all additional acts, instruments, and documents that may be reasonably necessary or desirable to implement and carry out the terms and intent of the Sale Agreement, the Bear Canyon

Agreement, this Order, and sale of the Mine Assets contemplated thereby and to take all further actions as may reasonably be requested by the Buyer in order to consummate, evidence, or confirm the provisions contained in such documents or for the purpose of assigning, transferring, granting, conveying and conferring to the Buyer, or reducing to possession in the Buyer, any or all of the Mine Assets and the assumption and assignment of the Mine Operating Agreements, without any further corporate action or orders of this Court.

32. The Buyer shall have no obligation to proceed with the Closing of the Sale Agreement until all conditions precedent to its obligations to do so have been met, satisfied or waived.

33. The Buyer may waive any or all, conditions precedent to Buyer's obligations as set forth in the Sale Agreement that have not been satisfied and proceed to close the transactions under the Sale Agreement, without any notice to the Court, any pre-petition or post-petition creditor of the Debtor, or any other party in interest.

34. The Trustee is authorized and directed to deposit and, to the extent set forth below, hold in escrow the "Purchase Price" (as defined in the Sale Agreement), and furthermore to make distributions from the Purchase Price as follows, with any undistributed proceeds remaining property of the Estate:

a. Pay all normal and ordinary settlement charges;

b. *COP*: The amount awarded by the Court to cure existing defaults under the COP Mine Operating Agreement pursuant to the Trustee's objection to COP's cure claim, which is $1,320,930.89, shall be held in a separate interest-bearing account, and shall be distributed as follows (COP's cure claim shall be deemed paid and cured in full by the deposit of this amount in

the herein-mentioned separate interest-bearing account):

i. *MMS-1*: Up to $331,045.00 to MMS at Closing, after accounting for any payments made by COP, Hiawatha or others to MMS after November 7, 2009, in payment of coal royalties (in pay-off of installment payoff plans or otherwise), fair market value lease payments, rental shortfalls, and late payment penalties assessed by MMS under the COP Federal Coal Leases and the ANR Federal Coal Leases, together with any interest due thereon;

ii. *MMS-2*: Such amount as is finally determined to be owing to MMS after resolution of the pending dispute among COP, MMS and the Trustee concerning the proper amount of the additional federal coal royalties claimed by the BLM as stated in its October 6, 2009 Issue Letter to COP. MMS has preliminarily assessed this amount at $1,071,348.51, which the Trustee disputes and which is subject to audit;

iii. *Offsets*: Any offsets granted by this Court to the Trustee against amounts owed by the Trustee to COP, which offsets are then in force after the MMS-1 and MMS-2 claims have been satisfied. Said offsets may include attorneys' fees and costs previously awarded the Trustee; and

iv. *COP*: The remaining balance, if any, to COP.

Any amounts paid to MMS or offset by Trustee pursuant to the foregoing provisions shall be credited against COP's $1,320,930.89 cure claim;

c. *PPMC*: $965,469.62 principal and $80,036.32 interest through March 15, 2010 (plus per diem interest of $233.07 from and after March 16, 2010) to P.P.M.C., Inc. ("**PPMC**") at Closing in partial satisfaction of its secured

claim against the Bank of Utah Equipment; $15,961.37 in disputed attorneys' fees purportedly incurred by the Bank of Utah shall be held in a separate interest-bearing account to which the lien of PPMC shall attach and from which shall be paid over to PPMC such amount that is determined to be owing after resolution of the dispute between the Trustee and PPMC concerning the payment of this amount;

d. *John Deere*: Up to $18,000.00, to John Deere Construction & Forestry Company ("**John Deere**") at Closing as payment in full of its secured claim against the John Deere Equipment and legal and other expenses arising from default, less any payments made by Hiawatha or others to John Deere after the date of the Sale Motion, together with any interest due thereon;

e. *Emery County, Utah-1*: $22,555.75 to Emery County, Utah ("**Emery County**") as payment in full for 2009 property taxes on parcel nos. 09-0300-0044, 09-0300-0082, 02-0064-002 and 02-0083-0001, together with interest and penalties thereon, which shall be in full satisfaction of this creditor's secured claims against the above tax parcels;

f. *Emery County, Utah-2*: $443,447.31 shall be held in a separate interest-bearing account to which the lien of Emery County shall attach and from which shall be paid over to Emery County such amount that is determined to be owing after resolution of a dispute concerning the proper amount of the 2009 assessed valuation of parcel no. 09-0300-0410;

g. *Carbon County, Utah*: $21,870.27 to Carbon County, Utah ("**Carbon County**") as payment in full for 2009 property taxes on parcel nos. SA-2942-

0000 and SA-2934-00000, together with interest and penalties thereon, which shall be in full satisfaction of this creditor's secured claims against the Mine Assets;

h. *Bear Canyon-I*: $300,000.00 to or at the direction of Bear Canyon as payment of an administrative fee pursuant to the Bear Canyon Agreement, as approved in the Bear Canyon Order;

i. *Bear Canyon-II*: $85,000.00 to or at the direction of Bear Canyon as part payment of the purchase price for the Bear Canyon Water Rights pursuant to the Bear Canyon Agreement, as approved in the Bear Canyon Order;

j. *Smith-Hartvigsen PLLC*: $6,700.00 to Smith Hartvigsen PLLC for the account of Bear Canyon pursuant to the Bear Canyon Agreement, as approved in the Bear Canyon Order;

k. *Kenwood Energy Group*: up to $109,617.26 to or at the direction of Kenwood Energy Group, LLC as a reimbursement for interim financing pursuant to the Bear Canyon Agreement, as approved in the Bear Canyon Order;

l. *Continuous Operations Reserve*: $661,000.00 shall be set aside and held in a separate interest-bearing account as the Continuous Operations Reserve referred to in Paragraph 16 of this Order, which may be used and/or released as set forth in such paragraph; and

m. Pay any other amounts required to be paid by the Debtor pursuant to the terms of the Sale Agreement and the Bear Canyon Agreement.

35. The Trustee and each other person or entity having duties or responsibilities under the Sale Agreement or the Bear Canyon Agreement, any agreements related thereto, or this Order

are authorized and empowered to carry out all of the provisions of the Sale Agreement, the Bear Canyon Agreement and any related agreements; to issue, execute, deliver, file and record, as appropriate, the documents evidencing and consummating the Sale Agreement and the Bear Canyon Agreement and any related documents necessary to effect the transactions contemplated by the Sale Agreement and the Bear Canyon Agreement; to take any and all actions contemplated by the Sale Agreement, the Bear Canyon Agreement any related agreements or this Order and to perform such other acts necessary to effect the transactions contemplated by the Sale Agreement and the Bear Canyon Agreement - all without further application to, or order of, the Court. The filing or recording of this Order with a governmental or public entity shall provide full notice of the contents of the Order.

36. Based upon the present record in this case, the sale of the Mine Assets is not subject to avoidance, and no damages may be assessed against the Buyer or any other party, pursuant to § 363(n) of the Bankruptcy Code.

Free and Clear Sale

37. Pursuant to 11 U.S.C. § 363(f) and § 365 and except as otherwise provided in this Order, effective as of the Closing, the sale of the Mine Assets by the Trustee to the Buyer shall constitute a legal, valid and effective transfer of all of the Debtor's, Trustee's, and Estate's right, title and interests in and to the Mine Assets, notwithstanding any requirement for approval or consent by any person, and shall vest Buyer with all such rights, title and interests in and to the Mine Assets, free and clear of liens, claims, encumbrances and interests held or claimed by persons or entities who have received notice of the Motion except as hereafter stated.

38. Buyer shall take the Mine Assets (together with and subject to all claims and defenses that the Buyer, Trustee or Debtor has with respect thereto) subject to: (a) the claims of

the following entities to use the surface of the property or to prospect for and remove oil and gas (the following list might use informal, principal or trade names in identifying the parties, but the formal legal entity for each party and any affiliates of that entity is intended and will be covered by the term used): (i) Premier Timber Company, (ii) Ash Jenkins-Sportsmans, (iii) XTO Energy Inc., (iv) River Gas, (v) Hatch Land and Livestock Company, (vi) Anadarko Petroleum, (vii) ConocoPhillips Company, and (viii) Dan Hunter; (b) property tax liens for the year 2010 and thereafter; (c) federal coal leases (including the COP Federal Coal Leases and the ANR Federal Coal Leases); (d) claims of any governmental entity for reclamation or environmental cleanup arising from conditions first existing on or prior to the Closing; and (e) the possessory lien interests of mechanics or repairmen in the following equipment: Isuzu Truck #64, Ford New Holland Tractor #29, Bobcat #2, Bobcat #3, Long Airdox Scoop 488 #2, Feeder Breaker #11. Buyer, however, shall take the Mine Assets free and clear of any claims of Hiawatha in and to the assets described on **Exhibit F Revised 7-14-2010** to this Order entitled "Hiawatha Improvements."

39. Except as otherwise specifically set forth in this Order, the Mine Assets shall be sold and transferred to Buyer free and clear of any and all interests arising from conditions first existing on or prior to the Closing, including claims (as defined in 11 U.S.C. § 101(5)) and liens (as defined in 11 U.S.C. § 101(37)), any claims based on theories of successor liability, and any interests in the ANR Real Property and/or COP Real Property claimed by Hiawatha, other than those specifically assumed or taken subject to by Buyer as set forth in this Order (including those described in Paragraph 39), held by any third party, in each case accruing, arising, or first existing in or relating to a period prior to the Closing (collectively, the "**Encumbrances**").

40. Except as otherwise expressly stated herein, Buyer shall not have any liability or responsibility arising under or related to, and shall not assume or be obligated to pay, perform or otherwise discharge, any and all Encumbrances.

41. All holders of Encumbrances of which the Mine Assets are sold free and clear who have come forward at the hearings on the Sale Motion shall have their Encumbrances attach only to the net proceeds of the sale received by the Trustee in the order of their priority, with the same validity, force and effect, if any, which they now have as against the Mine Assets and subject to all offsets, claims and defenses the Trustee or other parties may possess with respect thereto; provided, however, that liens for Encumbrances in favor of the following parties shall be limited to the approved disbursement amounts described in the following paragraphs and shall be discharged automatically upon payment of those amounts to the designated entity: (a) PPMC, see Paragraph 35(c); (b) John Deere, see paragraph 35(d); (c) Emery County, see Paragraphs 35(e) and (f)), and (d) Carbon County, see Paragraph 35(g).

42. Holders of Encumbrances who did not object to the Sale Motion are deemed to have consented pursuant to § 363(f)(2) of the Bankruptcy Code.

43. The Encumbrances include, without limitation:

a. Security interests in favor of the Bank of Utah that are now held by PPMC affecting the "**Bank of Utah Equipment**" shown in the attached Exhibit E-1;

b. Security interests in favor of John Deere affecting the "**John Deere Equipment**" shown in the attached Exhibit E-1;

c. 2009 tax liens in favor of Emery County affecting equipment, improvements and rights in coal reserves located in Emery County, Utah, as shown by the following assessments:

Parcel No.	Amount	Nominal "Owner"
09-0300-0410	$443,447.31	Hiawatha Coal Co-Bear Canyon
09-0300-0044	$14,646.43	C O P Coal Development Company
09-0300-0082	$7,827.10	ANR Co Inc
02-0064-0002	$32.86	ANR Co Inc
02-0063-0001	$49.35	ANR Co Inc

d. 2009 tax liens in favor of Carbon County affecting equipment, improvements and rights in coal reserves located in Carbon County, Utah, as shown by the following assessments:

Parcel No.	Amount	Nominal "Owner"
SA-2942-0000	$21,448.96	ANR Company Inc
SA-2934-0000	$421.31	Hiawatha Coal Co

e. Security interests in one or more items or types of personal property claimed by ABM, Inc. ("**ABM**"), Fidelity Funding Company ("**Fidelity Funding**"), Security Funding, Inc. ("**Security Funding**"), Standard Industries, Inc. ("**Standard**") and World Enterprises ("**World**") that are purportedly perfected by the following financing statements (the "**2007 Financing Statements**") naming Debtor (under an incorrect name), as debtor, and filed with the Utah Division of Corporations and Commercial Code (the "**Corporations Division**"):

Date	Filing No.	Secured Party(ies)
05/18/2007	320212200769	Security Funding, ABM, World
08/17/2007	326395200701	Security Funding, ABM, World
10/31/2007	331350200794	World, ABM, Security Funding, Fidelity Funding

11/21/2007	332771200704	ABM
11/21/2007	332773200700	Standard
11/21/2007	332766200704	Fidelity Funding
11/21/2007	332772200707	Security Funding
11/21/2007	332770200701	World

f. Security interests in one or more items or types of real and/or personal property claimed by Security Funding, Standard, World and Fidelity Funding and evidenced by the following real property security interests that encumber all or part of the COP Real Property or the ANR Real Property:

i. Real Property Security Agreement dated November 14, 2007, signed by C. W. Mining Company and World Enterprises and recorded December 7, 2007 in the office of the Emery County, Utah Recorder as entry no. 388434;

ii. Real Property Security Agreement dated November 14, 2007, signed by C. W. Mining Company and Security Funding and recorded December 7, 2007 in the office of the Emery County, Utah Recorder as entry no. 388435;

iii. Real Property Security Agreement dated November 14, 2007, signed by C. W. Mining Company and Standard Industries, Inc. and recorded December 7, 2007 in the office of the Emery County, Utah Recorder as Entry No. 388435; and

iv. Real Property Security Agreement (the "**Hiawatha-Fidelity Real Property Security Agreement**") dated effective June 24, 2008, signed by

Hiawatha and Fidelity Funding and recorded November 13, 2008 in the office of the Emery County, Utah Recorder as entry no. 392523.

g. Judgment lien claimed by Aquila, Inc. ("**Aquila**") in the COP Real Property and the ANR Real Property pursuant to a $24,891,988.00 judgment entered October 30, 2007. Aquila recorded the judgment, amended findings of fact and conclusions of law and related documents (each the "**Aquila Judgment**") with the following county recorders in Utah:

   i. Carbon County, Utah Recorder on November 1, 2007 as entry no. 126352, book 659, page 133 and entry no. 126352, book 659, page 133;

   ii. Emery County, Utah Recorder on November 1, 2007 as entry no. 387166 and as entry no. 387167; and

   iii. Salt Lake County, Utah Recorder on November 1, 2007 as entry no. 10265299, book 9533, page 486 and as entry no. 10265300, book 9533, page 490.

h. Security interests in one or more items or types of personal property claimed by the secured parties shown in the table below under financing statements ("**Hiawatha Financing Statements**") naming Hiawatha as debtor and filed with the Corporations Division:

Date	Filing No.	Secured Party(ies)
8/30/2008	350275200800	Security Funding
8/30/2008	350276200803	ABM
8/30/2008	350277200806	World
9/29/2008	351750200805	Fidelity Funding
9/29/2008	351776200803	A-Fab

Date	Filing No.	Secured Party(ies)
11/10/2008	354044200806	John Deere
1/6/2009	356698200904	Bank of Utah (and/or PPMC as assignee)
10/12/2009	370283200938	N.W.R. Limited Partnership
10/12/2009	370284200939	Standard
10/30/2009	371136200941	M.B.S.C. Llc
10/30/2009	371144200941	ABM
10/30/2009	371145200942	World
10/30/2009	371146200943	World
10/30/2009	371147200944	N.W.R. Limited Partnership
1/14/2010	374615201040	P.P.M.C., Inc.

i. Any lessor's lien claimed under Utah Code Annotated §38-3-1, et seq. that is claimed for rents due prior to the Closing Date either by COP under the COP Mine Operating Agreement or by ANR under the ANR Mine Operating Agreement.

j. Any and all competing right, title, interest and claim of Hiawatha, including without limitation any claim or interest arising under either: (a) a "Coal Mining Lease" between ANR and Hiawatha dated June 1997, as subsequently amended, which relates to the ANR Real Property; or (b) a "Coal Operating Agreement" between COP and Hiawatha dated June 23, 2008, as it might have been amended, which relates to the COP Real Property.

k. Any existing environmental conditions affecting the Mine Assets (except environmental conditions arising out of the reclamation required by Permits assumed by Buyer, for which Buyer shall be responsible) and any obligations with respect to the amelioration of same on an ongoing basis in that such

conditions and obligations may be "claims" within the meaning of the Bankruptcy Code in that the applicable governmental entities have a right to payment associated with those obligations under applicable law or could have performed the work itself and sought/seek reimbursement for same.

44. Buyer is giving substantial consideration under the Sale Agreement for the benefit of the holders of Encumbrances. The consideration given by Buyer shall constitute valid and valuable consideration for the releases of any Encumbrances, which releases shall be deemed to have been given in favor of Buyer by all holders of Encumbrances.

45. Effective on the Closing, all persons and entities, to the extent allowed by law, are forever prohibited and enjoined from commencing or continuing in any manner any action or other proceeding, whether in law or equity, in any judicial, administrative, arbitral or other proceeding against the Buyer, its successor and assigns, or the Mine Assets, based upon or with respect to Encumbrances of which the sale of the Mine Assets is free and clear under the terms of this Order.

46. Buyer does not constitute a successor to the Debtor or the Estate by reason of any theory of law or equity because except as set forth herein, Buyer is not expressly or impliedly agreeing to assume any of the Debtor's liabilities or debts; the transaction contemplated by the Sale Agreement does not amount to a consolidation, merger or de facto merger of Debtor and Buyer; Buyer is not merely a continuation of the Debtor; the transaction contemplated by the Sale Agreement is not being entered into fraudulently or in order for the Debtor to escape liability from the Debtor's debts; Buyer is not retaining the same employees; Buyer is not retaining (other than its use of the Mine Assets for mining coal) the same production facilities; Buyer does not maintain the same assets (other than its use of the Mine Assets for mining coal)

or the same business operations of the Debtor; Buyer does not have the same business name as the Debtor; and Buyer does not hold itself out to the public as a continuation of the Debtor's prior enterprise.

47. The assumption of any liabilities as provided under the terms of this Order by the Buyer shall constitute a legal, valid and effective delegation of any such liabilities to the Buyer and shall divest and release the Debtor and the Estate of all liability with respect to any such liabilities.

Transfer of Mine Assets

48. The Trustee is authorized to cooperate with Buyer in order for Buyer to obtain quiet enjoyment of the Mine, including: (a) putting Buyer into full possession of the scale house, shower house, storage shed or other structures in the immediate vicinity of surface operations at the Mine free of the claims of any occupants who are in possession of those buildings as of the Closing Date; and (b) causing Hiawatha or AFAB to remove any personal property that Hiawatha owns or is leasing from AFAB, such as any components of the longwall mining system located in the Mine as of the Closing.

49. No reclamation deposits, security deposits or other types of deposits being held by any person or entity under the name of the Debtor or the Trustee are being sold to Buyer. Buyer must promptly replace all such deposits with its own funds as contemplated by the Sale Agreement.

50. The provisions of this Order authorizing the sale of the Mine Assets free and clear of Encumbrances shall be self-executing, and neither the Trustee nor the Buyer shall be required to execute or file releases, termination statements, assignments, consents or other instruments in order to effectuate, consummate and implement the provisions of this Order.

51. Effective as of the Closing, the Buyer, its successors and assigns, shall be designated and appointed the Debtor's true and lawful attorney and attorneys, with full power of substitution, in the Debtor's name and stead, on behalf and for the benefit of the Buyer, its successors and assigns, to demand and receive any and all of the Mine Assets and to give receipts and releases for and in respect of the Mine Assets, or any part thereof, and from time to time to institute and prosecute in the Debtor's name, for the benefit of the Buyer, its successors and assigns, any and all proceedings at law, in equity or otherwise, which the Buyer, its successors and assigns, may deem proper for the collection or reduction to possession of any of the Mine Assets, and to do all acts and things with respect to the Mine Assets which the Buyer, its successors and assigns, shall deem desirable. The foregoing powers are coupled with an interest and are and shall be irrevocable by the Trustee.

52. On or before the Closing Date, all parties holding Encumbrances are authorized and directed to execute such documents and to take all other actions as may be necessary to release any Encumbrance against the Mine Assets. If any person or entity that has filed financing statements or other documents or agreements evidencing an Encumbrance in or against the Mine Assets shall not have delivered to the Buyer, within a reasonable time after request therefor, termination statements, instruments of satisfaction, or releases of all such Encumbrances with respect to the Mine Assets, the Buyer is hereby authorized to execute and file such statements, instruments, releases and other documents on behalf of the person or entity with respect to such Mine Assets.

53. Upon the occurrence of the Closing, this Order shall be considered and constitute for any and all purposes a full and complete general assignment, conveyance and transfer of the Mine Assets acquired by the Buyer under the Sale Agreement and/or a bill of sale or assignment

transferring good and marketable, indefeasible title and interest in the Mine Assets to the Buyer. Buyer is authorized to file for record in Emery County and Carbon County true copies of the Mine Operating Agreements, and the County Recorder for each of those counties shall accept such copies for recordation in accordance with paragraph 58 hereof.

54. Except as expressly provided in this Order, the Buyer is not assuming nor shall it nor any affiliate or subsidiary of Buyer be in any way liable or responsible, as a successor or otherwise, for any liabilities, debts or obligations of the Debtor in any way whatsoever relating to or arising from the Debtor's ownership or use of the Mine Assets prior to the consummation of the transactions contemplated by the Sale Agreement, or any liabilities calculable by reference to the Debtor or its operations or the Mine Assets, or relating to continuing or other conditions existing on or prior to consummation of the transactions contemplated by the Sale Agreement, which liabilities, debts, and obligations are hereby extinguished insofar as they may give rise to liability, successor or otherwise, against Buyer or any affiliate or subsidiary of the Buyer.

55. Except as otherwise expressly provided in this Order, all persons or entities, presently or on or after the Closing Date, in possession of some or all of the Mine Assets are directed to surrender possession of the Mine Assets to the Buyer on the Closing Date or at such time thereafter as the Buyer may request.

56. Any party owning or claiming the right to immediate possession of any mining equipment not included in the Mine Assets, including without limitation: (a) the longwall mining equipment,[3] which remains underground in the Mine on the Closing Date, (b) the equipment

[3] The longwall mining equipment consists only of the following items and related parts:
1. Longwall Shields - including (a) Shield water hoses, (b) Shield hydraulic hoses, (c) Shield Electrical cables, (d) Shield Controls, (e) Spare parts associated with shields.
2. Longwall Face Conveyor – including: (a) Face Conveyor chain and chain tubs, (b) Tail drive and motor(s); (c) Face electrical cables; (d) Face water hoses; (e) Face hydraulic hoses; and (f) Spare parts.
3. Longwall Shearer (including spare parts and bits).

described in Paragraph 28 of this Order; and (c) the equipment listed in **Exhibit G Revised 7-14-2010** shall remove such equipment within 90 days following the Closing at their own expense. If any such equipment is not removed within such 90-day period, then: (i) such equipment shall be promptly removed by the Trustee; (ii) the Trustee shall be entitled to reimbursement of the expenses of removing, transporting and storing such equipment from the owner(s) thereof or those who claim the right to immediate possession thereof; (iii) the Trustee shall have a lien on such equipment securing such obligation to reimburse the Trustee; and (iv) the Trustee shall have the right to retain such equipment pending foreclosure and to foreclose the lien if such obligation is not promptly satisfied. Any party seeking to enter the Mine to retrieve equipment shall execute a release and hold harmless agreement acceptable to Buyer, on usual and customary commercial terms, and shall provide evidence of insurance, reasonably acceptable to Buyer, covering such party's activities and any damage to or liability of Buyer or its affiliates and employees as a result of such activities.

Additional Provisions

57. Each and every federal, state and local governmental agency or department is hereby authorized to accept any and all documents and instruments necessary and appropriate to consummate the transactions contemplated by the Sale Agreement and this Order.

58. The Buyer has not assumed and is otherwise not obligated for any of the Debtor's liabilities other than as provided in this Order.

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4. Longwall Stageloader - including: (a) Head Drive and motor(s); (b) Stageloader chain and chain tubs; (c) Mobile tail.
5. Longwall Power Center - including: (a) Electrical control box(s); (b) Electrical cables; (c) Spare electrical parts.
6. Longwall Emulsion Pumps – including: (a) Pump skid; (b) Hydraulic hoses; (c) Pare hydraulic parts.
7. Longwall Monorail System – including: (a) Rails; (b) Trolley's; (c) Push Pull system.
8. DBT Shield Hauler (currently being leased to Signal Peak).
9. Shield Cables shown on Exhibit H-26.

59. Subject to the terms of the Sale Agreement, specific provisions of the Sale Agreement and any related agreements may be waived, modified, amended, or supplemented by agreement of the Trustee and the Buyer without further action or order of the Court; provided, however, that any such waiver, modification, amendment or supplement is not material and substantially conforms to and effectuates the Sale Agreement and any related agreement.

60. No bulk sale law or any similar law of any state or other jurisdiction shall apply in any way to the sale and the transactions contemplated by the Sale Agreement.

61. To the extent any provisions of this Order conflict with the terms and conditions of the Sale Agreement, the terms and conditions of this Order shall govern and control.

62. This Order constitutes a final and appealable order within the meaning of 28 U.S.C. § 158(a).

63. Notwithstanding Bankruptcy Rules 6004, 6006 and 7062, this Order shall become effective and enforceable seven days after entry at which time its provisions shall be self-executing. In the absence of any person or entity obtaining a stay pending appeal, the Trustee and the Buyer are free to close under the Sale Agreement at any time after the Order becomes effective, subject to the terms of the Sale Agreement. If, in the absence of any person or entity obtaining a stay pending appeal, the Debtor and the Buyer close under the Sale Agreement, the Buyer shall be deemed to be acting in "good faith" and shall be entitled to the protections of § 363(m) of the Bankruptcy Code as to all aspects of the transactions under and pursuant to the Sale Agreement if this Order or any authorization contained herein is reversed or modified on appeal.

64. If, in the absence of any person or entity obtaining a stay pending appeal, the Debtor and the Buyer close under the Sale Agreement, the Buyer shall be deemed to be acting in

"good faith" and shall be entitled to the protections of § 363(m) of the Bankruptcy Code as to all aspects of the transactions under and pursuant to the Sale Agreement if this Order or any authorization contained herein is reversed or modified on appeal.

65. This Court shall retain jurisdiction until the Closing of this case to:

a. Interpret, implement and enforce the terms of this Order and the Sale Agreement, all amendments thereto and any waivers or consents thereunder and each of the agreements executed in connection therewith in all respects;

b. Decide any disputes concerning this Order, the Sale Agreement or the rights and duties of the parties hereunder or thereunder or any issues relating to the Sale Agreement and this Order including, but not limited to, the interpretation of the terms, conditions and provisions hereof and thereof, the status, nature and extent of the Mine Assets and all issues and disputes arising in connection with the relief authorized herein;

c. Protect the Buyer or any of the Mine Operating Agreements or Mine Assets against any of the Encumbrances as provided herein including, without limitation, to enjoin the commencement or continuation of any action seeking to impose successor liability or bulk sale liability;

d. Enter orders in aid or furtherance of: (i) the transfer of possession and control from the Trustee to the Buyer; and (ii) the transactions contemplated by the Sale Agreement or to ensure the peaceful use and enjoyment of the Mine Operating Agreements or the Mine Assets by the Buyer;

e. Compel delivery of all Mine Assets to the Buyer;

f. Adjudicate any and all remaining issues, if any, concerning the Trustee's

right and authority to assume and assign the Mine Operating Agreements and the rights and obligations of the Estate and the Buyer with respect to such assignment and the existence of any default under any such Mine Operating Agreements as of the Closing Date;

g. Adjudicate any and all disputes concerning alleged pre-Closing Encumbrances in and to the Mine Assets, including the extent, validity, enforceability, priority, and nature of any such alleged Encumbrances; and

h. Adjudicate any and all disputes relating to the right, title or interest of the Debtor or the Estate in the Mine Assets and the proceeds thereof.

End of Order

CLERK'S CERTIFICATE

The undersigned certifies that on the ____ day of _____, 2010, a copy of the foregoing Order was served, via electronic transmission, on the following persons:

John T. Morgan (john.t.morgan@usdoj.gov)
Office of the United States Trustee
405 South Main, Suite 300
Salt Lake City, UT 84111

Mark Hansen (fmhlaw@comcast.net)
431 No. 1300 West
Salt Lake City, UT 84116

Russell S. Walker (rwalker@wklawpc.com)
David R. Williams (dwilliams@wklawpc.com)
Woodbury & Kesler
265 East 100 South, Suite 300
Salt Lake City, UT 84110-3358

Peter W. Guyon (pguyon@yahoo.com)
614 Newhouse Building
10 Exchange Place
Salt Lake City, UT 84111

Kevin Anderson (kanderson@fabianlaw.com)
David R. Hague (dhague@fabianlaw.com)
Fabian & Clendenin
215 South State, 12th Floor
Salt Lake City, UT 84151-0210

Kim R. Wilson (krw@scmlaw.com)
R. Matthew Cox (mcox@scmlaw.com)
Snow Christensen & Martineau
10 Exchange Place, 11th Floor
Salt Lake City, UT 84111

Oliver K. Myers (myersok@msn.com)
Oliver K. Myers, P.C.
265 East 100 South, Suite 301
Salt Lake City, UT 84111

Carl E. Kingston (carlkingston@yahoo.com
3213 South State Street
Salt Lake City, UT 84115

Conrad H. Johansen (conrad@osnlaw.com)
Olsen Skoubye & Nielson
999 E. Murray-Holladay Road, Suite 200
Salt Lake City, UT 84117

Lon Jenkins (lajenkins@joneswaldo.com)
Troy Aramburu (taramburu@joneswaldo.com)
Jones, Waldo, Holbrook & McDonough
170 South Main Street, Suite 1500
Salt Lake City, UT 84101

Danny C. Kelly (dckelly@stoel.com)
Stoel Rives
201 South Main Street, Suite 1100
Salt Lake City, UT 84111

Steven W. Call (scall@rqn.com)
Brent D. Wride (bwride@rqn.com
Ray, Quinney & Nebeker
36 South State, Suite 1400
Salt Lake City, UT 84145-0385

David E. Kingston
(davidekingston@yahoo.com)
3212 South State Street
Salt Lake City, UT 84115

Gerald H. Suniville (gsuniville@vancott.com)
Robert H. Scott (rscott@vancott.com)
Vancott, Bagley, Cornwall & McCarthy
36 South State Street, #1900
P.O. Box 45340
Salt Lake City, UT 84111

Steven W. Dougherty
(sdougherty@aklawfirm.com)
Anderson & Karrenberg
50 West Broadway, #700
Salt Lake City, UT 84101

Anna W. Drake (annadrake@att.net)
175 South Main Street, #1250
Salt Lake City, UT 84111

Ronald Rencher (rrencher@parsonsbehle.com)
Mark W. Dykes (mdykes@parsonsbehle.com)
Parsons Behle & Latimer
201 South Main, Suite 1800
Salt Lake City, UT 84145

William F. Dobbs, Jr.
(wdobbs@jacksonkelly.com)
500 Lee Street East, Suite 1600
P.O. Box 553
Charleston, WV 25322-0553

John A. Davis (john.davis@hro.com)
Holme Roberts & Owen LLP
299 South Main St, Suite 1800
Salt Lake City, UT 84111-2263

Stephen M. Hodges
(shodges@pennstuart.com)
208 E. Main Street
PO Drawer 2288
Abingdon, VA 24210

Richard E. Riggs (eriggs@tva.gov)
Edward C. Meade (ecmeade@tva.gov)
Tennessee Valley Authority
400 West Summit Hill Drive
Knoxville, Tennessee 37902

Mona L. Burton (mburton@hollandhart.com)
Holland & Hart LLP
60 East South Temple #2000
Salt Lake City, Utah 8411

George Hofmann (gbh@pklawyers.com)
Parsons, Kinghorn, Harris
111 E. Broadway, 11th Floor
Salt Lake City, Utah 84111

CLERK

Exhibit A to
Order Authorizing Sale of Mine Assets
Free and Clear of all Liens, Claims, Encumbrances, and Interests
and Authorizing the Assumption and Assignment of Executory Contracts
Under 11 U.S.C. §§ 363 and 365

Fee and federal coal lands covered by
COP Mine Operating Agreement and located in Emery County, Utah

The following parcels of land that are located in Emery County, Utah:

LEASED GROUND

BEAR CANYON

U-024316 Issued: 8-1-80

T. 16 S., R. 7 E., SLM, Utah
Sec. 13: W2W2
Sec. 14: NE, E2NW

Containing 400 acres, more or less.

U-024318 Issued: 8-1-80

T. 16 S., R. 7 E., SLM, Utah
Sec. 26: E2NW

Containing 80 acres, more or less.

MOHRLAND

U-61048 Revised: 10-29-92

T. 16 S., R. 7 E., SLM, Utah
Sec. 1; Lot 1, SENE, E2SE
Sec. 12; E2NE

T. 16 S., R. 8 E., SLM, Utah
Sec. 6; Lots 11-14, E2SW, W2SE, SESE
Sec. 7; Lots 1, 2, E2NW, W2NE, SENE, SE

Sec. 8; SWSW

Containing 1,108.27 acres, more or less.

U-61049 Modified: 6-19-2002

Tract 1: T. 16 S., R. 7 E., SLM, Utah
Sec. 1, Lot 2, SWNE, W2SE;
Sec. 12, W2NE, E2W2, SE;
Sec. 13; E2, E2W2

T. 16 S., R. 8 E., SLM, Utah
Sec. 7; Lots 3, 4, E2SW
Sec. 18; Lots 1-4, E2, E2W2
Sec. 19; SWNE, NWSE
Sec. 20; SENW, NESW

Tract 2: T. 16 S., R. 8 E., SLM, Utah
Sec. 19, SENE, NESE;
Sec. 20, SWNW, NWSW

Containing 2,196.09 acres, more or less.

McCADDEN HOLLOW

U-46484 Readjusted: 5-1-88

T. 16 S., R. 7 E., SLM, Utah
Sec. 10; N2, N2S2, SESW, S2SE
Sec. 11; ALL
Sec. 12; W2W2

Containing 1,400 acres, more or less.

WILD HORSE RIDGE

U-020668 Readjusted: 5-1-88

T. 16 S., R. 7 E., SLM, Utah
Sec. 25; SENE, NESE

T. 16 S., R. 8 E., SLM, Utah
Sec. 30; Lots 1-4, W2NE, E2W2, NWSE

Sec. 31; NENW, NWNE

Containing 626.32 acres, more or less.

U-038727 Modified: 6-19-2002

Tract 1: T. 16 S., R. 7 E., SLM, Utah
Sec. 24, SENE, E2SE
Sec. 25, N2NE, SWNE, SWNW, NWSW, W2SE, SESE

T. 16 S., R. 8 E., SLM, Utah
Sec. 19; Lots 2-4, SENW, E2SW, SWSE

Tract 2: T. 16 S., R. 7 E., SLM, Utah
Sec. 24, NENE.

Containing 780.39 acres, more or less.

FEE GROUND

T. 16S, R. 7E, SLB&M
Section 14: S ½, W ½ NW ¼,
Section 23: All
Section 24: W ½, W ½ E ½
Section 25: NW ¼ NW ¼, E ½ NW ¼, NE ¼ SW ¼
Section 26: NE ¼

T. 16S, R. 8E, SLB&M
Section 7: E ½ NE ¼
Section 8: N ½ SW ¼, SE ¼ SW ¼, W ½ SE ¼
Section 16: W ½ W ½
Section 17: All
Section 19: Lot 1, NE ¼ NW ¼, N ½ NE ¼
Section 20: N ½ NW ¼, NE ¼, NE ¼ SE ¼

U-61049 Modified: 6-19-2002

Tract 1: T. 16 S., R. 7 E., SLM, Utah
Sec. 1, Lot 2, SWNE, W2SE;
Sec. 12, W2NE, E2W2, SE;
Sec. 13; E2, E2W2

T. 16 S., R. 8 E., SLM, Utah

Sec. 7; Lots 3, 4, E2SW
Sec. 18; Lots 1-4, E2, E2W2
Sec. 19; SWNE, NWSE
Sec. 20; SENW, NESW

Tract 2: T. 16 S., R. 8 E., SLM, Utah
Sec. 19, SENE, NESE;
Sec. 20, SWNW, NWSW

Containing 2,196.09 acres, more or less.

Exhibit B to
Order Authorizing Sale of Mine Assets
Free and Clear of all Liens, Claims, Encumbrances, and Interests
and Authorizing the Assumption and Assignment of Executory Contracts
Under 11 U.S.C. §§ 363 and 365

COP Mine Operating Agreement, with effective amendments

See attached.

COAL OPERATING AGREEMENT

THIS AGREEMENT made and entered into this day of March, 1997, by and between C.O.P. Coal Development Company, a Utah corporation, hereinafter referred to as "Owner", and C. W. Mining Company, a Utah corporation, hereinafter referred to as "Operator";

WITNESSETH, that:

In consideration of the covenants and agreements hereinafter contained, the parties hereto mutually and severally agree as follows:

Owner, in consideration of the royalties to be paid and conditions to be observed as hereinafter set forth, does hereby grant unto Operator the exclusive authority to operate and control the following described tracts of land, situated in the State of Utah, for the term of 25 years, beginning March 1, 1997, and extending to February 28, 2022:

See Exhibit "A" attached hereto and made a part hereof

1. USE OF PROPERTY

Operator shall have the exclusive right to, and use of the described property for purposes reasonably incident to the mining and removal of coal, including any existing underground workings or facilities heretofore placed in or upon the leased area. Operator shall also have unrestricted use of all access roads leading to and from the described property.

2. ROYALTIES

Operator shall pay a royalty equal to the lesser of 8% or the maximum royalty allowed by law of the average gross realization on every ton (2,000 lbs.) of coal mined and removed from the described premises. In computing the average gross realization, severance and or sales taxes shall not be considered as part of the sale price. The royalty on coal stockpiled shall not become due or payable until actual shipment of the stockpiled coal from the premises.

Operator shall, on or before the twentieth day of each month during the term hereof, pay to the Owner all sums due to the Owner hereunder for the preceding calendar month as shown by the statement to be furnished as hereinafter provided.

For any advance royalties paid by Owner on the Federal Coal Leases, Operator shall reimburse Owner for those advance royalties, in the amounts and at such times as they would become due in the course of mining the coal, had Owner not paid the advance royalties.

3. STATEMENTS AND MINE MAPS

Operator shall make and furnish to the Owner on or before the twentieth day of each month during the term of this Agreement, a statement of the amount of coal removed from said coal lands, such statement to be made under the hand and certificate of the Operator. Operator shall also make and furnish the Owner, at least once each year, an up-to-date mine map of workings on the premises. Operator agrees to keep a true, correct and accurate account of coal removed from

the premises, and a true and accurate map of all mines or workings now or hereafter opened or used on the premises. The properly authorized representatives of Owner shall have free and full access to the accounts, books, and records of the Operator relating to tonnage's of coal removed.

4. CONDITION OF PROPERTY

2 It is expressly understood that the property herein referred to is delivered to Operator in its present condition and that the Operator is familiar with said property and accepts the same in its present condition and assumes full responsibility for all known or unknown defects.

5. OPERATION OF MINE

Operator shall diligently and continuously operate the subject property for the term hereof unless the operation thereof prevented by strike, car shortages, government regulation, any act of God, or similar cause beyond the control of Operator, or unless all of the merchantable coal in said premises is sooner extracted, mined and removed. Operator shall conduct all operations hereunder in a good and minerlike manner and in a manner which will result in the ultimate maximum economic recovery of coal from the property. Operator agrees to hold harmless Owner from any and all damages, claims, costs and expenses arising from or by reason of the caving or subsidence of the surface when such caving or subsidence is caused directly or indirectly by the operations of the Operator.

Operator shall pay all operating expenses tor Operator's mining operation, including mining machinery, lumber, timber, permits, etc.

Operator shall, in the operation and development of the premises, comply with all applicable Federal, State, and local laws, that apply to Operator's mining operation and shall conduct its mining operations and take all actions and perform all duties required to maintain the Federal and State mining permits and approvals relating to the Premises.

Operator shall hold Owner harmless from and against any and all damages, claims, costs, and expenses arising from or growing out of any injuries to, or death of, the employees of the Operator or any other person whomsoever, where such injury, death or damage occurs of or in connection with the possession, use or operation in any manner of the property.

6. SURVEYS AND INSPECTIONS

Owner or its agents may and shall at all reasonable times have free access to said premises and the mine, or mines open thereon, or which may hereafter be opened thereon, and to all workings thereon for the purpose of determining whether the said property is being maintained, protected, and used in accordance with the terms of this agreement; and for the purpose of checking the tonnage of coal which may be mind and extracted by the Operator.

From time to time, Owner may cause a survey of the mine or mines of the Operator to be made by some competent engineer selected by Owner for the purpose of checking the statements made by Operator of the coal removed from the premises, and of the amounts paid as royalties by

reason thereof and for the purpose of determining the manner in which the mining upon the premises has been or is being performed. Operator may be present, or his duly appointed representative, at the making of any such survey and shall furnish necessary men free of expense to Owner to assist Owner's said engineer in making such a survey.

3

7. TAXES

Operator shall pay all taxes with respect to Operator's mining operation, equipment, and other property used by Operator.

Operator shall pay all general state and county taxes assessed against the premises.

8. TERMINATION OF AGREEMENT

Upon the termination of this Agreement by expiration, surrender, forfeiture, or any other cause, Operator shall have the privilege at any time within a period of 6 months thereafter of removing from the premises all machinery, equipment, tools, materials, etc. placed by Operator in or on the premises. If reasonably required, Operator may have an additional period of not more than 6 months within which to remove stockpiled coal and coal dust, subject of course, to the payment of the royalties on any such coal or coal dust so removed.

9. DEFAULT

If Operator shall not comply with any of the provisions, or covenants, or agreements herein written and contained, and such default shall continue for a period of 60 days after service of written notice, by certified or registered mail, by Owner identifying the default and specifying with reasonable particularity the nature and extent thereof, then and in such event this Agreement may be terminated and all of the rights of the Operator shall cease and be wholly determined and Owner may at once take possession of any or all of the properties herein described.

10. HEIRS AND SUCCESSORS

Each obligation hereunder shall extend to, and be binding upon, and every benefit hereof shall inure to, the heirs, executors, administrators, successors, or assigns of the respective parties hereto.

IN WITNESS WHEREOF, the parties hereto have caused these presents to be executed as of the day and year first above written.

C.O.P. Coal Development Company
Owner

By: Joseph O. Kington

C. W. Mining Company
Operator

D. J. Sanders

STATE OF UTAH)
:)
County of Salt Lake)

On this 11 day of March, 1997, personally appeared before me Joseph O. Kingston _____, who being by duly sworn, did say that he is the President of C.O.P. Coal Development Company, Inc. and that the within and foregoing instrument was signed on behalf of said corporation by authority of a resolution of its board of directors, and said Joseph O. Kingston duly acknowledged to me that said corporation executed the same .

NOTARY PUBLIC
CARL E. KINGSTON
3212 South State St.
Salt Lake City, Utah 84115
My Commission Expires
July 1, 2000
STATE OF UTAH

Notary Public

STATE OF UTAH)
:)
County of Salt Lake)

On this 11 day of _____, 1997, personally appeared before me D.J. Sanders _____, who being by duly sworn, did say that he is the President of C. W. Mining Company and that the within and foregoing instrument was signed on behalf of said corporation by authority of a resolution of its board of directors, and said D.J. Sanders duly acknowledged to me that said corporation executed the same .

NOTARY PUBLIC
CARL E. KINGSTON
3212 South State St.
Salt Lake City, Utah 84115
My Commission Expires
July 1, 2000
STATE OF UTAH

Notary Public

U-024316 Issued: 8-1-80

T.16 S., R.7 E., SLM, Utah
Sec. 13: W2W2
Sec. 14: NE, E2NW

Containing 400 acres, more or less.

U-024318 Issued: 8-1-80

T.16 S., R.7 E., SLM, Utah
Sec 26: E2NW

Containing 80 acres, more or less.

MOHRLAND

U-61048 Revised: 10-29-92

T. 16 S., R. 7 E., SLM, Utah
Sec. 1; Lot 1, SENE, E2SE
Sec. 12; E2NE

T. 16 S., R. 8 E., SLM, Utah
Sec. 6; Lots 11-14, E2SW, W2SE, SESE
Sec. 7; Lots 1, 2, E2NW, W2NE, SENE, SE
Sec. 8; SWSW

Containing 1,108.27 acres, more or less.

U-61049 Revised: 11-1-89

T. 16 S., R. 7 E., SLM, Utah
Sec. 1; Lot 2, SWNE, W2SE
Sec. 12; W2NE, E2W2, SE
Sec. 13; E2, E2W2

T. 16 S., R. 8 E., SLM, Utah
Sec. 7; Lots 3, 4, E2SW
Sec. 18; lots 1-4, E2,E2W2
Sec. 19; SWNE, NWSE
Sec. 20; SENW, NESW

Containing 2,036.09 acres, more or less.

McCADDEN HOLLOW

U-46484 Readjusted: 5-1-88

T.16 S., R.7 E. SLM, Utah
Sec 10; N2, N2S2, SESW, S2SE
Sec 11; ALL
Sec 12; W2W2

Containing 1,400 acres, more or less.

WILD HORSE RIDGE

U-020668 Readjusted: 5-1-88

T.16 S., R.7 E., SLM, Utah
Sec 25; SENE, NESE

T.16 S., R.8 E., SLM, Utah
Sec 30; Lots 1 - 4, W2NE, E2W2, NWSE
Sec 31; NENW, NWNE

Containing 626.32 acres, more or less

U-038727 Readjusted: 5-1-88

T.16 S., R.7 E., SLM, Utah
Sec 24; SENE, E2SE
Sec 25; N2NE, SWNE, SWNW, NWSW, W2SE, SESE

T.16 S., R.8 E., SLM, Utah
Sec 19; Lots 2-4, SENW, E2SW, SWSE

Containing 740.39 acres, more or less

FEE GROUND

T. 16S, R. 7E, SLB&M
Section 14: S 1/2, W 1/2 NW 1/4,
Section 23: All
Section 24: W 1/2, W1/2 E 1/2
Section 25: NW 1/4 NW 1/4, E 1/2 NW 1/4, NE 1/4 SW 1/4
Section 26: NE 1/4

T. 16S, R. 8E, SLB&M
Section 7: E 1/2 NE 1/4
Section 8: N 1/2 SW 1/4, SE 1/4 SW 1/4, W 1/2 SE 1/4
Section 16: W 1/2 W 1/2
Section 17: All
Section 19: Lot 1, NE 1/4 NW 1/4, N 1/2 NE 1/4
Section 20: N 1/2 NW 1/4, NE 1/4, NE 1/4 SE 1/4

COAL OPERATING AGREEMENT

THIS AGREEMENT made and entered into this day of March, 1997, by and between C.O.P. Coal Development Company, a Utah corporation, hereinafter referred to as "Owner", and C. W. Mining Company, a Utah corporation, hereinafter referred to as "Operator":

WITNESSETH, that:

In consideration of the covenants and agreements hereinafter contained, the parties hereto mutually and severally agree as follows:

Owner, in consideration of the royalties to be paid and conditions to be observed as hereinafter set forth, does hereby grant unto Operator the exclusive authority to operate and control the following described tracts of land, situated in the State of Utah, for the term of 25 years, beginning March 1, 1997, and extending to February 28, 2022:

See Exhibit "A" attached hereto and made a part hereof

1. USE OF PROPERTY

Operator shall have the exclusive right to, and use of the described property for purposes reasonably incident to the mining and removal of coal, including any existing underground workings or facilities heretofore placed in or upon the leased area. Operator shall also have unrestricted use of all access roads leading to and from the described property.

2. ROYALTIES

Operator shall pay a royalty equal to the lesser of 8% or the maximum royalty allowed by law of the average gross realization on every ton (2,000 lbs.) of coal mined and removed from the described premises. In computing the average gross realization, severance and or sales taxes shall not be considered as part of the sale price. The royalty on coal stockpiled shall not become due or payable until actual shipment of the stockpiled coal from the premises.

Operator shall, on or before the twentieth day of each month during the term hereof, pay to the Owner all sums due to the Owner hereunder for the preceding calendar month as shown by the statement to be furnished as hereinafter provided.

For any advance royalties paid by Owner on the Federal Coal Leases, Operator shall reimburse Owner for those advance royalties, in the amounts and at such times as they would become due in the course of mining the coal, had Owner not paid the advance royalties.

3. STATEMENTS AND MINE MAPS

Operator shall make and furnish to the Owner on or before the twentieth day of each month during the term of this Agreement, a statement of the amount of coal removed from said coal lands, such statement to be made under the hand and certificate of the Operator. Operator shall also make and furnish the Owner, at least once each year, an up-to-date mine map of workings on the premises. Operator agrees to keep a true, correct and accurate account of coal removed from

the premises, and a true and accurate map of all mines or workings now or hereafter opened or used on the premises. The properly authorized representatives of Owner shall have free and full access to the accounts, books, and records of the Operator relating to tonnage's of coal removed.

4. CONDITION OF PROPERTY

It is expressly understood that the property herein referred to is delivered to Operator in its present condition and that the Operator is familiar with said property and accepts the same in its present condition and assumes full responsibility for all known or unknown defects.

5. OPERATION OF MINE

Operator shall diligently and continuously operate the subject property for the term hereof unless the operation thereof prevented by strike, car shortages, government regulation, any act of God, or similar cause beyond the control of Operator, or unless all of the merchantable coal in said premises is sooner extracted, mined and removed. Operator shall conduct all operations hereunder in a good and minerlike manner and in a manner which will result in the ultimate maximum economic recovery of coal from the property. Operator agrees to hold harmless Owner from any and all damages, claims, costs and expenses arising from or by reason of the caving or subsidence of the surface when such caving or subsidence is caused directly or indirectly by the operations of the Operator.

Operator shall pay all operating expenses for Operator's mining operation, including mining machinery, lumber, timber, permits, etc.

Operator shall, in the operation and development of the premises, comply with all applicable Federal, State, and local laws, that apply to Operator's mining operation and shall conduct its mining operations and take all actions and perform all duties required to maintain the Federal and State mining permits and approvals relating to the Premises.

Operator shall hold Owner harmless from and against any and all damages, claims, costs, and expenses arising from or growing out of any injuries to, or death of, the employees of the Operator or any other person whomsoever, where such injury, death or damage occurs of or in connection with the possession, use or operation in any manner of the property.

6. SURVEYS AND INSPECTIONS

Owner or its agents may and shall at all reasonable times have free access to said premises and the mine, or mines open thereon, or which may hereafter be opened thereon, and to all workings thereon for the purpose of determining whether the said property is being maintained, protected, and used in accordance with the terms of this agreement; and for the purpose of checking the tonnage of coal which may be mind and extracted by the Operator.

From time to time, Owner may cause a survey of the mine or mines of the Operator to be made by some competent engineer selected by Owner for the purpose of checking the statements made by Operator of the coal removed from the premises, and of the amounts paid as royalties by

reason thereof and for the purpose of determining the manner in which the mining upon the premises has been or is being performed. Operator may be present, or his duly appointed representative, at the making of any such survey and shall furnish necessary men free of expense to Owner to assist Owner's said engineer in making such a survey.

7. TAXES

Operator shall pay all taxes with respect to Operator's mining operation, equipment, and other property used by Operator.

Operator shall pay all general state and county taxes assessed against the premises.

8. TERMINATION OF AGREEMENT

Upon the termination of this Agreement by expiration, surrender, forfeiture, or any other cause, Operator shall have the privilege at any time within a period of 6 months thereafter of removing from the premises all machinery, equipment, tools, materials, etc. placed by Operator in or on the premises. If reasonably required, Operator may have an additional period of not more than 6 months within which to remove stockpiled coal and coal dust, subject of course, to the payment of the royalties on any such coal or coal dust so removed.

9. DEFAULT

If Operator shall not comply with any of the provisions, or covenants, or agreements herein written and contained, and such default shall continue for a period of 60 days after service of written notice, by certified or registered mail, by Owner identifying the default and specifying with reasonable particularity the nature and extent thereof, then and in such event this Agreement may be terminated and all of the rights of the Operator shall cease and be wholly determined and Owner may at once take possession of any or all of the properties herein described.

10. HEIRS AND SUCCESSORS

Each obligation hereunder shall extend to, and be binding upon, and every benefit hereof shall inure to, the heirs, executors, administrators, successors, or assigns of the respective parties hereto.

IN WITNESS WHEREOF, the parties hereto have caused these presents to be executed as of the day and year first above written.

C.O.P. Coal Development Company
Owner

By: _____

C. W. Mining Company
Operator

_____

STATE OF UTAH)
:
County of)

On this 11th day of March, 1997, personally appeared before me J. O. Kingston, who being by duly sworn, did say that he is the President of C.O.P. Coal Development Company, Inc. and that the within and foregoing instrument was signed on behalf of said corporation by authority of a resolution of its board of directors, and said J. O. Kingston duly acknowledged to me that said corporation executed the same .

Notary Public
CARL E. KINGSTON
2212 South State Street
Salt Lake City, Utah 84115
My Commission Expires
July 1, 2004
State of Utah

Carl E. Kingston
Notary Public

STATE OF UTAH)
:
County of)

On this day of _____, 1997, personally appeared before me B.W. Stoddard, who being by duly sworn, did say that he is the President of C. W. Mining Company and that the within and foregoing instrument was signed on behalf of said corporation by authority of a resolution of its board of directors, and said B.W. Stoddard duly acknowledged to me that said corporation executed the same .

Lenore Stone 3/24/97
Notary Public

COP BK Docs016

BEAR CANYON

U-024316 Issued: 8-1-80

T.16 S., R.7 E., SLM, Utah
Sec. 13: W2W2
Sec. 14: NE, E2NW

Containing 400 acres, more or less.

U-024318 Issued: 8-1-80

T.16 S., R.7 E., SLM, Utah
Sec 26: E2NW

Containing 80 acres, more or less.

MOHRLAND

U-61048 Revised: 10-29-92

T. 16 S., R. 7 E., SLM, Utah
Sec. 1; Lot 1, SENE, E2SE
Sec. 12; E2NE

T. 16 S., R. 8 E., SLM, Utah
Sec. 6; Lots 11-14, E2SW, W2SE, SESE
Sec. 7; Lots 1, 2, E2NW, W2NE, SENE, SE
Sec. 8; SWSW

Containing 1,108.27 acres, more or less.

U-61049 Revised: 11-1-89

T. 16 S., R. 7 E., SLM, Utah
Sec. 1; Lot 2, SWNE, W2SE
Sec. 12; W2NE, E2W2, SE
Sec. 13; E2, E2W2

T. 16 S., R. 8 E., SLM, Utah
Sec. 7; Lots 3, 4, E2SW
Sec. 18; lots 1-4, E2,E2W2
Sec. 19; SWNE, NWSE
Sec. 20; SENW, NESW

Containing 2,036.09 acres, more or less.

COP BK Docs017

Exhibit A
p. 1

McCADDEN HOLLOW

U-46484 Readjusted: 5-1-88

T.16 S., R.7 E. SLM, Utah
Sec 10; N2, N2S2, SESW, S2SE
Sec 11; ALL
Sec 12; W2W2

Containing 1,400 acres, more or less.

WILD HORSE RIDGE

U-020668 Readjusted: 5-1-88

T.16 S., R.7 E., SLM, Utah
Sec 25; SENE, NESE

T.16 S., R.8 E., SLM, Utah
Sec 30; Lots 1 - 4, W2NE, E2W2, NWSE
Sec 31; NENW, NWNE

Containing 626.32 acres, more or less

U-038727 Readjusted: 5-1-88

T.16 S., R.7 E., SLM, Utah
Sec 24; SENE, E2SE
Sec 25; N2NE, SWNE, SWNW, NWSW, W2SE, SESE

T.16 S., R.8 E., SLM, Utah
Sec 19; Lots 2-4, SENW, E2SW, SWSE

Containing 740.39 acres, more or less

FEE GROUND

T. 16S, R. 7E, SLB&M
Section 14: S 1/2, W 1/2 NW 1/4,
Section 23: All
Section 24: W 1/2, W1/2 E 1/2
Section 25: NW 1/4 NW 1/4, E 1/2 NW 1/4, NE 1/4 SW 1/4
Section 26: NE 1/4

T. 16S, R. 8E, SLB&M
Section 7: E 1/2 NE 1/4
Section 8: N 1/2 SW 1/4, SE 1/4 SW 1/4, W 1/2 SE 1/4
Section 16: W 1/2 W 1/2
Section 17: All
Section 19: Lot 1, NE 1/4 NW 1/4, N 1/2 NE 1/4
Section 20: N 1/2 NW 1/4, NE 1/4, NE 1/4 SE 1/4

F 3

AMENDMENT TO COAL OPERATING AGREEMENT

THIS AMENDMENT, made and entered into this ____ day of June, 2000, to that certain Coal Operating Agreement by and between C.O.P. COAL DEVELOPMENT COMPANY, and C. W. MINING COMPANY, dated March _____, 1997, WITNESSETH:

The parties, for good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged agree that the above referenced Agreement is amended as follows:

Paragraph 2. ROYALTIES is hereby amended to read:

Operator shall pay a royalty of four percent (4%) of the average gross realization n every ton (2,000 lbs.) of coal mined and removed from the described premises. In computing the average gross realization, severance and or sales taxes shall not be considered as part of the sale price. The royalty on coal stockpiled shall not become due or payable until actual shipment of the stockpiled coal from the premises.

Operator shall, on or before the twentieth day of each month during the term hereof, pay to the Owner all sums due to the Owner hereunder for the preceding calendar month as shown by the statement to be furnished as hereinafter provided.

Operator shall be responsible for paying all royalties on the Federal Coal Leases at the rate determined by the Lessor. For any advance royalties paid by Owner on the Federal Coal Leases, Operator shall reimburse Owner for those advance royalties, in the amounts and at such times as they would become due in the course of mining the coal, had Owner not paid the advance royalties.

Except as herein amended, the Coal Operating Agreement and all of the terms and conditions contained therein shall remain in full force and effect.

IN WITNESS WHEREOF, the parties have executed this instrument as of the day and year first written above.

C.O.P Coal Development Company, Inc. C. W. Mining Company

By

By

SECOND AMENDMENT TO COAL OPERATING AGREEMENT

THIS AMENDMENT, made and entered into this ____ day of June, 2002, to that certain Coal Operating Agreement by and between C.O.P. COAL DEVELOPMENT COMPANY, and C. W. MINING COMPANY, dated March, 1997, WITNESSETH:

The parties, for good and valuable consideration, the receipt and sufficiency of which is herby acknowledged agree that the above referenced Agreement is amended as follows:

The operator is granted exclusive authority to operate and control the 40.00 acres added to Federal Lease UTU-38727 and the 160.00 acres added to Federal Lease UTU-61049.

In Exhibit A the legal description of Federal Leases UTU-38727 and UTU-61049 is amended as follows:

U-61049 Modified: 6-19-2002

Track 1: T16 S., R. 7 E., SLM, Utah
Sec. 1, Lot 2, SWNE, W2SE;
Sec. 12, W2NE, E2W2, SE;
Sec. 13; E2, E2W2

T16 S., R. 8 E., SLM, Utah
Sec. 7; Lots 3, 4, E2SW
Sec. 18; Lots 1-4, E2, E2W2
Sec. 19; SWNE, NWSE
Sec. 20; SENW, NESW

Track 2:

T16 S., R. 8 E., SLM, Utah
Sec. 19, SENE, NESE;
Sec. 20, SWNW, NWSW

Containing 2,196.09 acres, more or less.

U-038727 Modified: 6-19-2002

Track 1: T16 S., R. 7 E., SLM, Utah
Sec. 24, SENE, E2SE
Sec. 25, N2NE, SWNE, SWNW, NWSW, W2SE, SESE

T16 S., R. 8 E., SLM, Utah
Sec. 19; Lots 2-4, SENW, E2SW, SWSE

Track 2:

T16 S., R. 7 E., SLM, Utah
Sec. 24, NENE.

Containing 780.39 acres, more or less.

Except as herein amended, the Coal Operating Agreement and all of the terms and conditions contained therein shall remain in full force and effect.

IN WITNESS WHEREOF, the parties have executed this instrument as of the day and year first written above.

C.O.P Coal Development Company, Inc.

By

C. W. Mining Company

By

Exhibit C to
Order Authorizing Sale of Mine Assets
Free and Clear of all Liens, Claims, Encumbrances, and Interests
and Authorizing the Assumption and Assignment of Executory Contracts
Under 11 U.S.C. §§ 363 and 365

Fee and Federal coal lands covered by ANR Mine Operating Agreement
and located in Carbon County and Emery County, Utah

The following parcels of land that are located in Carbon County, Utah or Emery County, Utah:

LEASED GROUND

Federal Coal Lease SL – 025431:

Township 15S, Range 7E, SLB&M
Section 36: S1/2 NE1/4, E1/2 SE1/4

Township 15S, Range 8E
Section 31: E1/2, E1/2 W1/2, Lots 1, 2, 3 and 4

Township 16S, Range 8E
Section 5: lots 8 and 12 (Excepting from the above Federal Coal Lease, Lots 1 and 5)
Section 6: lots 1 through 10

Federal Coal Lease SL – 069985:

Township 15S, Range 7E
Section 25: W1/2 E1/2
Section 36: N1/2 NE1/4, W1/2 SE1/4

Federal Coal Lease U-51923:

Township 15S, Range 8E, SLB&M
Section 20: NW1/4

FEE GROUND

Township 15S, Range 7E, SLB&M
Section 24: SE1/4 SE1/4
Section 25: E1/2 E1/2

Township 15S, Range 8E, SLB&M
Section 19: All
Section 20: SW1/4
Section 29: W1/2
Section 30: All
Section 32: W1/2

Township 16S, Range 8E, SLB&M
Section 5: Lots 2, 3, 4, 6, 7, 9, 10, 11, S1/2
Section 6: NE1/4 SE1/4
Section 8: E1/2 NE1/4; E1/2 SE1/4

g:\rht\d\6119 exhibit c.docx

Exhibit D to
Order Authorizing Sale of Mine Assets
Free and Clear of all Liens, Claims, Encumbrances, and Interests
and Authorizing the Assumption and Assignment of Executory Contracts
Under 11 U.S.C. §§ 363 and 365

ANR Mine Operating Agreement, with effective amendments

See attached.

COAL OPERATING AGREEMENT

THIS AGREEMENT made and entered into this . day of September, 1999, by and between ANR, Inc,, a Utah corporation, hereinafter referred to as "Owner", and C. W. Mining Company, a Utah corporation, hereinafter referred to as "Operator";

WITNESSETH, that:

In consideration of the covenants and agreements hereinafter contained, the parties hereto mutually and severally agree as follows:

Owner, in consideration of the royalties to be paid and conditions to be observed as hereinafter set forth, does hereby grant unto Operator the exclusive authority to operate and control the following described tracts of land, situated in the State of Utah, for the term of 25 years, beginning September 1, 1999, and extending to August 31, 2024:

Federal Coal Lease SL - 025431:

Township 15S, Range 7E, SLB&M
§36: S1/2 NE1/4, E1/2 SE1/4

Township 15S, Range 8E
§31: E1/2, E1/2 W1/2, Lots 1,2,3 and 4

Township 16S, Range 8E
§5: lots 8 and 12 (Excepting from the above Federal Coal Lease, Lots 1 and 5)
§6: lots 1 through 10

Federal Coal Lease SL - 069985:

Township 15S, Range 7E
§25: W1/2 E1/2
§36: N1/2 NE1/4, W1/2 SE1/4

1. USE OF PROPERTY

Operator shall have the exclusive right to, and use of the described property for purposes reasonably incident to the mining and removal of coal, including any existing underground workings or facilities heretofore placed in or upon the leased area. Operator shall also have unrestricted use of all access roads leading to and from the described property.

2. ROYALTIES

Operator shall pay a royalty of four percent (4%) of the average gross realization on every ton (2,000 lbs.) of coal mined and removed from the described premises. In computing the average gross realization, severance and or sales taxes shall not be considered as part of the sale price. The royalty on coal stockpiled shall not become due or payable until actual shipment of the stockpiled coal from the premises.

Operator shall, on or before the twentieth day of each month during the term hereof, pay to the Owner all sums due to the Owner hereunder for the preceding calendar month as shown by the statement to be furnished as hereinafter provided.

For any advance royalties paid by Owner on the Federal Coal Leases, Operator shall reimburse Owner for those advance royalties, in the amounts and at such times as they would become due in the course of mining the coal, had Owner not paid the advance royalties.

3. STATEMENTS AND MINE MAPS

Operator shall make and furnish to the Owner on or before the twentieth day of each month during the term of this Agreement, a statement of the amount of coal removed from said coal lands, such statement to be made under the hand and certificate of the Operator. Operator shall also make and furnish the Owner, at least once each year, an up-to-date mine map of workings on the premises. Operator agrees to keep a true, correct and accurate account of coal removed from the premises, and a true and accurate map of all mines or workings now or hereafter opened or used on the premises. The properly authorized representatives of Owner shall have free and full access to the accounts, books, and records of the Operator relating to tonnage's of coal removed.

4. CONDITION OF PROPERTY

It is expressly understood that the property herein referred to is delivered to Operator in its present condition and that the Operator is familiar with said property and accepts the same in its present condition and assumes full responsibility for all known or unknown defects.

5. OPERATION OF MINE

Operator shall diligently and continuously operate the subject property for the term hereof unless the operation thereof prevented by strike, car shortages, government regulation, any act of God, or similar cause beyond the control of Operator, or unless all of the merchantable coal in said premises is sooner extracted, mined and removed. Operator shall conduct all operations hereunder in a good and minerlike manner and in a manner which will result in the ultimate maximum economic recovery of coal from the property. Operator agrees to hold harmless Owner from any and all damages, claims, costs and expenses arising from or by reason of the caving or subsidence of the surface when such caving or subsidence is caused directly or indirectly by the operations of the Operator.

Operator shall pay all operating expenses for Operator's mining operation, including mining machinery, lumber, timber, permits, etc.

Operator shall, in the operation and development of the premises, comply with all applicable Federal, State, and local laws, that apply to Operator's mining operation and shall conduct its mining operations and take all actions and perform all duties required to maintain the Federal and State mining permits and approvals relating to the Premises.

Operator shall hold Owner harmless from and against any and all damages, claims, costs, and expenses arising from or growing out of any injuries to, or death of, the employees of the Operator or any other person whomsoever, where such injury, death or damage occurs of or in connection with the possession, use or operation in any manner of the property.

6. SURVEYS AND INSPECTIONS

Owner or its agents may and shall at all reasonable times have free access to said premises and the mine, or mines open thereon, or which may hereafter be opened thereon, and to all workings thereon for the purpose of determining whether the said property is being maintained, protected, and used in accordance with the terms of this agreement; and for the purpose of checking the tonnage of coal which may be mind and extracted by the Operator.

From time to time, Owner may cause a survey of the mine or mines of the Operator to be made by some competent engineer selected by Owner for the purpose of checking the statements made by Operator of the coal removed from the premises, and of the amounts paid as royalties by reason thereof and for the purpose of determining the manner in which the mining upon the premises has been or is being performed. Operator may be present, or his duly appointed representative, at the making of any such survey and shall furnish necessary men free of expense to Owner to assist Owner's said engineer in making such a survey.

7. TAXES

Operator shall pay all taxes with respect to Operator's mining operation, equipment, and other property used by Operator.

Operator shall pay all general state and county taxes assessed against the premises.

8. TERMINATION OF AGREEMENT

Upon the termination of this Agreement by expiration, surrender, forfeiture, or any other cause, Operator shall have the privilege at any time within a period of 6 months thereafter of removing from the premises all machinery, equipment, tools, materials, etc. placed by Operator in or on the premises. If reasonably required, Operator may have an additional period of not more than 6 months within which to remove stockpiled coal and coal dust, subject of course, to the payment of the royalties on any such coal or coal dust so removed.

9. DEFAULT

If Operator shall not comply with any of the provisions, or covenants, or agreements herein written and contained, and such default shall continue for a period of 60 days after service of written notice, by certified or registered mail, by Owner identifying the default and specifying with reasonable particularity the nature and extent thereof, then and in such event this Agreement may be terminated and all of the rights of the Operator shall cease and be wholly determined and Owner may at once take possession of any or all of the properties herein described.

10. HEIRS AND SUCCESSORS

Each obligation hereunder shall extend to, and be binding upon, and every benefit hereof shall inure to, the heirs, executors, administrators, successors, or assigns of the respective parties hereto.

IN WITNESS WHEREOF, the parties hereto have caused these presents to be executed as of the day and year first above written.

4

ANR Company, Inc.
Owner

By: Jesse O. Kingston

C. W. Mining Company
Operator

D.J. Sanders

STATE OF UTAH)
:
County of Salt Lake)

On this 3 day of September, 1999, personally appeared before me Jesse O. Kingston, who being by duly sworn, did say that he is the President of ANR Company, Inc. and that the within and foregoing instrument was signed on behalf of said corporation by authority of a resolution of its board of directors, and said Jesse O. Kingston duly acknowledged to me that said corporation executed the same.

NOTARY PUBLIC
CARL E. KINGSTON
3212 South State St.
Salt Lake City, Utah 84115
My Commission Expires
July 1, 2000
STATE OF UTAH

Carl E. Kingston
Notary Public

STATE OF UTAH)
:
County of Salt Lake)

On this 3 day of September, 1999, personally appeared before me D.J. Sanders, who being by duly sworn, did say that he is the President of C. W. Mining Company and that the within and foregoing instrument was signed on behalf of said corporation by authority of a resolution of its board of directors, and said D.J. Sanders duly acknowledged to me that said corporation executed the same.

NOTARY PUBLIC
CARL E. KINGSTON
3212 South State St.
Salt Lake City, Utah 84115
My Commission Expires
July 1, 2000
STATE OF UTAH

Carl E. Kingston
Notary Public

COAL OPERATING AGREEMENT

THIS AGREEMENT made and entered into this day of September, 1999, by and between ANR, Inc., a Utah corporation, hereinafter referred to as "Owner", and C. W. Mining Company, a Utah corporation, hereinafter referred to as "Operator";

WITNESSETH, that:

In consideration of the covenants and agreements hereinafter contained, the parties hereto mutually and severally agree as follows:

Owner, in consideration of the royalties to be paid and conditions to be observed as hereinafter set forth, does hereby grant unto Operator the exclusive authority to operate and control the following described tracts of land, situated in the State of Utah, for the term of 25 years, beginning September 1, 1999, and extending to August 31, 2024:

Federal Coal Lease SL - 025431:

Township 15S, Range 7E, SLB&M
§36: S1/2 NE1/4, E1/2 SE1/4

Township 15S, Range 8E
§31: E1/2, E1/2 W1/2, Lots 1,2,3 and 4

Township 16S, Range 8E
§5: lots 8 and 12 (Excepting from the above Federal Coal Lease, Lots 1 and 5)
§6: lots 1 through 10

Federal Coal Lease SL - 069985:

Township 15S, Range 7E
§25: W1/2 E1/2
§36: N1/2 NE1/4, W1/2 SE1/4

1. USE OF PROPERTY

Operator shall have the exclusive right to, and use of the described property for purposes reasonably incident to the mining and removal of coal, including any existing underground workings or facilities heretofore placed in or upon the leased area. Operator shall also have unrestricted use of all access roads leading to and from the described property.

2. ROYALTIES

Operator shall pay a royalty of four percent (4%) of the average gross realization on every ton (2,000 lbs.) of coal mined and removed from the described premises. In computing the average gross realization, severance and or sales taxes shall not be considered as part of the sale price. The royalty on coal stockpiled shall not become due or payable until actual shipment of the stockpiled coal from the premises.

Operator shall, on or before the twentieth day of each month during the term hereof, pay to the Owner all sums due to the Owner hereunder for the preceding calendar month as shown by the statement to be furnished as hereinafter provided.

For any advance royalties paid by Owner on the Federal Coal Leases, Operator shall reimburse Owner for those advance royalties, in the amounts and at such times as they would become due in the course of mining the coal, had Owner not paid the advance royalties.

3. STATEMENTS AND MINE MAPS

Operator shall make and furnish to the Owner on or before the twentieth day of each month during the term of this Agreement, a statement of the amount of coal removed from said coal lands, such statement to be made under the hand and certificate of the Operator. Operator shall also make and furnish the Owner, at least once each year, an up-to-date mine map of workings on the premises. Operator agrees to keep a true, correct and accurate account of coal removed from the premises, and a true and accurate map of all mines or workings now or hereafter opened or used on the premises. The properly authorized representatives of Owner shall have free and full access to the accounts, books, and records of the Operator relating to tonnage's of coal removed.

4. CONDITION OF PROPERTY

It is expressly understood that the property herein referred to is delivered to Operator in its present condition and that the Operator is familiar with said property and accepts the same in its present condition and assumes full responsibility for all known or unknown defects.

5. OPERATION OF MINE

Operator shall diligently and continuously operate the subject property for the term hereof unless the operation thereof prevented by strike, car shortages, government regulation, any act of God, or similar cause beyond the control of Operator, or unless all of the merchantable coal in said premises is sooner extracted, mined and removed. Operator shall conduct all operations hereunder in a good and minerlike manner and in a manner which will result in the ultimate maximum economic recovery of coal from the property. Operator agrees to hold harmless Owner from any and all damages, claims, costs and expenses arising from or by reason of the caving or subsidence of the surface when such caving or subsidence is caused directly or indirectly by the operations of the Operator.

Operator shall pay all operating expenses for Operator's mining operation, including mining machinery, lumber, timber, permits, etc.

Operator shall, in the operation and development of the premises, comply with all applicable Federal, State, and local laws, that apply to Operator's mining operation and shall conduct its mining operations and take all actions and perform all duties required to maintain the Federal and State mining permits and approvals relating to the Premises.

Operator shall hold Owner harmless from and against any and all damages, claims, costs, and expenses arising from or growing out of any injuries to, or death of, the employees of the Operator or any other person whomsoever, where such injury, death or damage occurs of or in connection with the possession, use or operation in any manner of the property.

6. SURVEYS AND INSPECTIONS

Owner or its agents may and shall at all reasonable times have free access to said premises and the mine, or mines open thereon, or which may hereafter be opened thereon, and to all workings thereon for the purpose of determining whether the said property is being maintained, protected, and used in accordance with the terms of this agreement; and for the purpose of checking the tonnage of coal which may be mind and extracted by the Operator.

From time to time, Owner may cause a survey of the mine or mines of the Operator to be made by some competent engineer selected by Owner for the purpose of checking the statements made by Operator of the coal removed from the premises, and of the amounts paid as royalties by reason thereof and for the purpose of determining the manner in which the mining upon the premises has been or is being performed. Operator may be present, or his duly appointed representative, at the making of any such survey and shall furnish necessary men free of expense to Owner to assist Owner's said engineer in making such a survey.

7. TAXES

Operator shall pay all taxes with respect to Operator's mining operation, equipment, and other property used by Operator.

Operator shall pay all general state and county taxes assessed against the premises.

8. TERMINATION OF AGREEMENT

Upon the termination of this Agreement by expiration, surrender, forfeiture, or any other cause, Operator shall have the privilege at any time within a period of 6 months thereafter of removing from the premises all machinery, equipment, tools, materials, etc. placed by Operator in or on the premises. If reasonably required, Operator may have an additional period of not more than 6 months within which to remove stockpiled coal and coal dust, subject of course, to the payment of the royalties on any such coal or coal dust so removed.

9. DEFAULT

If Operator shall not comply with any of the provisions, or covenants, or agreements herein written and contained, and such default shall continue for a period of 60 days after service of written notice, by certified or registered mail, by Owner identifying the default and specifying with reasonable particularity the nature and extent thereof, then and in such event this Agreement may be terminated and all of the rights of the Operator shall cease and be wholly determined and Owner may at once take possession of any or all of the properties herein described.

10. HEIRS AND SUCCESSORS

Each obligation hereunder shall extend to, and be binding upon, and every benefit hereof shall inure to, the heirs, executors, administrators, successors, or assigns of the respective parties hereto.

IN WITNESS WHEREOF, the parties hereto have caused these presents to be executed as of the day and year first above written.

4

ANR Company, Inc.
Owner

By: J.O. Kingston

C. W. Mining Company
Operator

B.W. Stoddard

STATE OF UTAH)
:
County of)

On this 9th day of September, 1999, personally appeared before me J.O. Kingston, who being by duly sworn, did say that he is the President of ANR Company, Inc. and that the within and foregoing instrument was signed on behalf of said corporation by authority of a resolution of its board of directors, and said J.O. Kingston duly acknowledged to me that said corporation executed the same.

Notary Public
CARL E. KINGSTON
3212 South State Street
Salt Lake City, Utah 84115
My Commission Expires
July 1, 2004
State of Utah

Carl E. Kingston
Notary Public

STATE OF UTAH)
:
County of)

On this day of September, 1999, personally appeared before me B.W. Stoddard, who being by duly sworn, did say that he is the President of C. W. Mining Company and that the within and foregoing instrument was signed on behalf of said corporation by authority of a resolution of its board of directors, and said B.W. Stoddard duly acknowledged to me that said corporation executed the same.

Leanne Stone 9-27-99
Notary Public

My commission expires 7-10-02

AMENDMENT TO COAL OPERATING AGREEMENT

THIS AMENDMENT, made and entered into this 26 day of June, 2000, to that certain Coal Operating Agreement by and between ANR, INC., and C. W. MINING COMPANY, dated September ____, 1999, WITNESSETH:

The parties, for good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, agree that the above referenced Agreement is amended as follows:

In addition to those tracts of land described in the Agreement, Operator is also granted the exclusive authority to operate and control the following described tract of land, situated in the State of Utah, for the remainder of the term set forth in the Agreement:

Federal Coal LeaseU-51923:
Township 15S, Range 8E, SLB&M
Section 20: NW1/4

Also, Paragraph 2. ROYALTIES is hereby amended to read:

Operator shall pay a royalty of four percent (4%) of the average gross realization on every ton (2,000 lbs.) of coal mined and removed from the described premises. In computing the average gross realization, severance and or sales taxes shall not be considered as part of the sale price. The royalty on coal stockpiled shall not become due or payable until actual shipment of the stockpiled coal from the premises.

Operator shall, on or before the twentieth day of each month during the term hereof, pay to the Owner all sums due to the Owner hereunder for the preceding calendar month as shown by the statement to be furnished as hereinafter provided.

Operator shall be responsible for paying all royalties on the Federal Coal Leases at the rate determined by the Lessor. For any advance royalties paid by Owner on the Federal Coal Leases, Operator shall reimburse Owner for those advance royalties, in the amounts and at such times as they would become due in the course of mining the coal, had Owner not paid the advance royalties.

Except as herein amended, the Coal Operating Agreement and all of the terms and conditions contained therein shall remain in full force and effect.

IN WITNESS WHEREOF, the parties have executed this instrument as of the day and year first written above.

ANR Company, Inc.

By

C. W. Mining Company

By

SECOND AMENDMENT TO COAL OPERATING AGREEMENT

THIS AMENDMENT, made and entered into this ____ day of April 2001, to that certain Coal Operating Agreement by and between ANR, INC., and C. W. MINING COMPANY, dated September ____ , 1999, WITNESSETH:

The parties, for good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, agree that the above referenced Agreement is amended as follows:

In addition to those tracts of land described in the Agreement, and in the Amendment to Coal Operating Agreement dated June 30, 2000, Operator is also granted the exclusive authority to operate and control the following described tracts of land, situated in the State of Utah, for the remainder of the term set forth in the Agreement:

Fee Ground:
Township 15S, Range 7E, SLB&M
Section 24: SE1/4 SE1/4
Section 25: E1/2 E1/2

Township 15S, Range 8E, SLB7M
Section 19: All
Section 20: SW1/4
Section 29: W1/2
Section 30: All
Section 32: W1/2

Township 16S, Range 8, SLB&M
Section 5: Lots 2,3,4,6,7,9,10,11, S1/2
Section 6: NE1/4 SE1/4
Section 8: E1/2 NE1/4; E1/2 SE1/4

Except as herein amended, the Coal Operating Agreement and all of the terms and conditions contained therein shall remain in full force and effect.

IN WITNESS WHEREOF, the parties have executed this instrument as of the day and year first written above.

ANR Company, Inc.

By

C. W. Mining Company

By

Exhibit E-1 to
Order Authorizing Sale of Mine Assets
Free and Clear of all Liens, Claims, Encumbrances, and Interests
and Authorizing the Assumption and Assignment of Executory Contracts
Under 11 U.S.C. §§ 363 and 365

Equipment Lists

See attachment.

CW Mining Company
Bear Canyon Mine
Asset List and Values

	CW MINING MINING EQUIPMENT LIST	INCLUDED IN SALE		
Equipment Category	Equipment Description	Status / Location	Comment	June 2008 Appraisal Fair Market Value
"Equipment Utilized both Underground and Surface"	Truck # 100, 02 Dodge w/fire supression	Runs		$9,000
	Truck # 101, 02 Dodge w/fire suppression	Runs		$14,000
	Truck # 102, 02 Dodge w/fire suppression	Runs		$14,000
	Truck # 103, 99 Dodge w/fire suppression	Runs		$14,000
	~~Truck # 104, 02 Dodge w/fire suppression~~	~~Retired~~		~~$9,000~~
	Truck # 84, Isuzu w/fire suppression	Out for Rebuild	Rebuild on Hold	$7,000
	Truck # 85, 86, Isuzu w/fire suppression	On site		$7,000
	Truck # 87, 92, Isuzu w/fire suppression	Runs		$7,000
	~~Truck # 73, 94 Dodge w/fire suppression~~	~~Scrapped~~		~~$6,000~~
	Truck # 75, 99 Dodge w/fire suppression	Runs		$7,000
	~~Truck # 76, 94 Dodge w/fire suppression~~	~~Retired~~		~~$7,000~~
	~~Truck # 77, 94 Dodge w/fire suppression~~	~~Scrapped~~		~~$7,000~~
	~~Truck # 78, 93 Dodge w/fire suppression~~	~~Retired~~		~~$500~~
	~~Truck # 82, 94 Dodge w/fire suppression~~	~~Retired~~		~~$6,000~~
	Truck # 85, 94 Chev w/fire suppression	Not running		$1,000
	Truck # 86, 99 Dodge w/fire suppression	Not running		$8,000
	~~Truck # 91, Geep, w/fire suppression~~	~~Retired~~		~~$6,000~~
	~~Truck # 92, Geep, w/fire suppression~~	~~Retired~~		~~$6,000~~
	Truck # 93, Geep, w/fire suppression	Runs		$5,000
	~~Truck # 94, Geep, w/fire suppression~~	~~Retired~~		~~$6,000~~
	~~Truck # 95, Geep, w/fire suppression~~	~~Retired~~		~~$6,000~~
	~~Truck # 96, 02 Dodge, w/fire suppression~~	~~Retired~~		~~$14,000~~
	Trucks 1296/1297 MSHA Tags		This is $ to purchase Tags	$3,000
	Truck # 97, 02 Dodge, w/fire suppression	Runs		$14,000
	Trucks 1298/1299 MSHA Tags		This is $ to purchase Tags	$3,000
	Truck # 98, 02 Dodge, w/fire suppression	Runs		$14,000
	~~Truck # 99, Chevy, w/fire suppression~~	~~Scrapped~~		~~$9,000~~
	Belt Systems (All)	UG and Surface	Includes the plant	$2,181,000
	Rock dust system and trickle duster	Surface	Runs	$83,000
	# 3 Mine Fan	Surface	Runs	$8,000
	# 4 Mine Fan	Surface	Runs	$40,000
	UG Computer Monitoring	Dispatch room		$4,500
	SCSRS(Osenco, CSE) Breathing Apparatus	Mine		$116,000
	Communication Equipment	Leaky feeder		$116,700
	Total (W/o Retired and Scrapped Equipment)			$2,676,200
Surface Equipment	~~Ice Cream Truck # 71~~	~~Scrapped 2008~~		~~$1,000~~
	~~Ice Cream Truck # 72~~	~~Scrapped 2008~~		~~$1,000~~
	Truck # 89, Chev gas	Runs	Surface	$7,000
	Truck # 90, Chev gas	Runs	Surface	$9,000
	Man Lift	Runs		$8,000
	1979 Ford Dump Truck	Runs	Actually, 1980(?) Kenworth	$8,000
	Army Truck 66x 5 Ton	Runs		$12,000
	Misc. Supply Trailers	Noted several	Noted 9 UG	$45,000
	Trailer for 6x6	1 on truck		$500
	Trailer for 6x6	Ug at #3 mine		$500
	Trailer for 6x6	Ug at #3 mine		$500
	~~Trailer for 6x6~~	~~Scrapped~~		~~$500~~
	2 Newmatic Trailers	Surface		$40,000
	Golf Cart	In #3 mine		$500
	Komatsu WA 600 Loader # 3	Runs		$80,000
	~~Komatsu WA 600 Loader # 4~~	~~Retired~~	~~Junkyard~~	~~$50,000~~
	Tipple and Coal Handling System	Operational		
	Ford New Holland Tractor # 28	UG	XC 39 Intake	$10,000
	Ford New Holland Tractor # 29	Not running	Rebuild on Hold	$10,000
	CAT Backhoe	Shop	Has problems	$8,000
	Forklift # 1	Runs		$8,000
	Dynolift/White Forklift	Off site	At Hiawahta mine	$12,000
	IR Forklift # 4	UG	Runs, can setter	$40,000
	Lo-trac Forklift # 5	LW	Runs	$40,000
	Gehl Forklift # 7	Runs		$35,000
	Gehl Forklift # 8	Runs	# 3 mine portal	$18,000
	Lo-trac Forklift # 9	Not running	Parts machine	$40,000
	Greenlee, tozzer & Honda Generator	Warehouse	Small	$1,000
	~~Gehl Skid # 1~~	~~Retired~~	~~Junkyard?~~	~~$3,000~~
	~~Gehl Skid # 2~~	~~Retired~~	~~Junkyard?~~	~~$3,000~~
	Bobcat # 2	Out for Rebuild	Rebuild on Hold - Scots machine	$6,000
	Bobcat # 3	Out for Rebuild	Rebuild on Hold - Scots machine	$7,000
	Air compressor	Surface	Runs	$1,500
	Surface LW Transformer	Tank portal	Operational	$75,700
	CM and General Mine Transformer	Tank portal	Operational	
	Impulse Generator	Warehouse	Thumper	$500
	Computers	Office	Many replaced	$10,000
	Longwall Substation	#4 Mine Portal		$263,000
	Improvements on Scales/Truck Weighing	#3 Belt	Scales	$72,500
	Roof Bolting	From records	Miscellaneous	$12,300
	UG Misc. Supplies	From records	Miscellaneous	$1,700
	Mine Rescue Equipment	Bathhouse		$60,000
	Headlamp Supplies	Dispatch room		$22,500
	Pallet Racking	Shelves	Outside scale house	$300
	Supplies (UG, Shop, Office, Basement)	Prior to HCC sale	Charles to check – actual value May 2009?	$1,146,000
	Surface Buildings - Office, scale house, shop, miscellaneous			
	Iron Worker	Shop		$5,300
	Pipe Bender	Shop		$200
	Large Tools	Shop	Miscellaneous	$5,700
	Welders	Surface	4 surf, 1 ug	$12,000
	Coal Analyzer	Surface	Mid 1990s	$2,800

CW Mining Company
Bear Canyon Mine
Asset List and Values

	CW MINING MINING EQUIPMENT LIST	INCLUDED IN SALE		
Equipment Category	Equipment Description	Status / Location	Comment	June 2008 Appraisal Fair Market Value
	Electronic Office Equipment	Surface	Comm system at truck loadout	$13,000
	Computer Hardware	Surface	Value from records	$15,000
	Furniture and Fixtures	Surface	Value from records	$700
	3, Folding Tables	Surface	Value from records	$45
	John Deere 320 Skid Loader	Runs	Surface	$20,000
	Total (W/o Retired and Scrapped Equipment)			$2,186,745
Underground Mobile Equip.	Illegal Shield Hauler	Surface	Old Lowboy	$96,500
	~~Kubota Tractor # 19~~	~~Retired~~		~~$2,500~~
	~~Bear Trac Tractor # 20~~	~~Retired~~	~~At Junk yard~~	~~$2,000~~
	Bear Trac Tractor # 21	#3 mine portal	Not running	$40,000
	Fletcher Mechanics Tractor	Surface	Out of service ~ 2 years, can run	$18,000
	Club Trac Tractor # 25	Not running		$20,000
	~~Club Trac Tractor # 26~~	~~Retired~~	~~At Junk yard~~	~~$20,000~~
	~~Tractor # 27~~	~~???~~	~~Last record 7/07~~	~~$7,000~~
	Getman 220 Tractor # 30	Shop	Out of service ~ bad engine	$190,000
	Getman 220 Tractor # 31	Longwall	Runs	$212,000
	Arnold Grader # 2	Surface	Operating - some issues	$15,000
	Long Airdox Scoop 466 # 2	Out for Rebuild	Rebuild on Hold ~ Highland Machine	$50,000
	Long Airdox Scoop 466 # 3	4 L	Runs	$50,000
	Diamond Core drill # 2	West Bleeder	Valve bank problems	$25,000
	MG Set Mobile Generator	West Bleeder?		$50,000
	Total (W/o Retired and Scrapped Equipment)			$766,500
U/G Stationary Equipment	Belt Storage Unit	4L	600 ft capcity Continental	$300,000
	Water pumps	UG	Various	$79,000
	Water lines	UG	Various	$35,700
	Magnets	#4 Mine	Others	$19,700
	UG Electrical(not cable or transformers)	Misc		$34,500
	UG Transformer	UG	Various	$38,000
	LW Transformers	#4 mine portal		$3,700
	UG Cables/ Transformer	Misc		$130,000
	Total			$640,600
U/G Continuous Miner Equiment	Long Airdox Single Boom Bolter # 5	#4 mine	XC 7 intake	$5,000
	Long Airdox Single Boom Bolter # ~~6~~ ~~8~~	#4 mine	XC 50 "garbage"	$5,000
	Long Airdox Single Boom Bolter # 7	#4 mine	Not runing	$5,000
	Fletcher Twin Boom Bolter	2 East Mains	XC 53-54 new mid 1990s, nothing replaced	$350,000
	Feeder # 11	Out for rebuild	At Morgantown "On Hold"	$55,000
	Feeder # 12	4 Left	Runs	$35,000
	Feeder # 13	2 East Mains	Runs	$75,000
	Feeder # 14	Raise bore	Used as feeder for coal transfer	$20,000
	Total			$550,000
Other equipment noted during May 5, 2009 inspection and understood to be owned by CW Mining in addition to Appraisal List				
	Fletcher Roof Ranger Bolter - single boom	Runs	Tank mine XC 39 intakes	
	CAT trackhoe	Runs	Surface	
	Belt winder at XC 35	Runs	Tank mine XC 35 intakes	
	Miner extractor at XC 33	Runs	Tank mine XC 33 intakes	
	Switch gear	Runs	Tank mine XC 20 intakes	
	Switch gear	Runs	Tank mine XC 45 intakes	
	Belt drive 200hp recent rebuilt, unused		Tank mine XC 3 intakes	
	~~Joy shields 12,37,26,21~~		~~Tank mine XC 21 (3 intakes~~	
	# 8 Drive -- transformer #26			
	# 9 Drive -- transformer #9			
	Transformer pumps		Tank mine XC 9	
	Transformer #11		Tank mine XC 20	
	Transformer for 3 left belt & Winch controller		Tank mine XC 37	

Notes:
Equipment values take from Appraisal completed by *Statewide Auction Company, Dated June 4, 2008*
* Some of these vehicles may be utilized to transport inspection personnel or materials underground, normally on surface

CW Mining Company
Bear Canyon Mine
Asset List and Values

BANK OF UTAH EUQIPMENT LIST		INCLUDED IN SALE - BID SEPARATE		
Equipment Category	**Equipment Description**	**Status / Loc.**	**Comment**	June 2008 Appraisal **Fair Market Value**
U/G Continuous Miner	14CM15 JOY Miner # 5	4 Left	Runs	$550,000
	14CM15 JOY Miner # 6	2 East Mains	Runs -- overcasts	$625,000
	JOY Cable Car # 23	2 East Mains	Runs 53- 54 XC	$200,000
	JOY Cable Car # 24	2 East Mains	Runs 53- 54 XC	$200,000
	JOY Cable Car # 25	4 Left	Runs -- #1 entry	$300,000
	JOY Cable Car # 26	4 Left	Runs -- #1 entry -- full of coal	$300,000
	Total			**$2,175,000**

Notes:
Equipment values take from Appraisal completed by *Statewide Auction Company, Dated June 4, 2008*

CW Mining Company
Bear Canyon Mine
Asset List and Values

JOHN DEERE EQUIPMENT LIST — **INCLUDED IN SALE - BID SEPARATE**

Equipment Category	Equipment Description	Status / Loc.	Comment	June 2008 Appraisal Fair Market Value
Skid Steer	John Deere ~~450 E SN G731157~~ 320 S/N 154591	Off site	At Hiawahta mine	$9,000

Equipment values take from Appraisal completed by *Statewide Auction Company, Dated June 4, 2008*

	HIAWATHA EQUIPMENT LIST AFAB LEASED TO HCC FOR CW MINING		EXCLUDED FROM SALE	
Equipment Category	**Equipment Description**	**Status/Location**	**Comment**	**Fair Market Value**
	Skid mounted tailpiece for LW	Longwall		
	Cat 988 loader	Surface		

AFAB LEASE LIST
AFAB LEASED TO CW MINING

EXCLUDED FROM SALE

Equipment Category	Equipment Description	Status/Location	Comment	Fair Market Value
	Noted during May 2009 visit			
	Crawler mounted tail piece	Not in use	Tank intake XC 23	
	Emulsion tank and pump	Not in use	Tank intake XC 24	
	Shield trailer		Tank intake XC 25	
	Shearer trailer		Tank intake XC 25	
	Belt storage unit	3L	800 ft capacity Continental	
	LW 2400V power supply	3L	2 power centers 2400/4160	
	Kamat mixing pump and tank	LW		
	Eimco 915 scoop	LW		
	Shield hauler		3 Mine	
	Eimco 936 scoop M-1			
	Crane 790 C	Surface		

Other Equipment from AFAB lease schedule (not seen during mine visit)
3 - 818 Battery coal haulers
3- 848 Rebuild Battert coal haulers
12 Batteries
6 Battery Chargers

Longwall equipment - General Listing

Equipment Category	Equipment Description	#	Comment	Fair Market Value
Shields	Joy and Hemischidt	103		
Shearer	Joy 4 LS	1		
Tailpiece		1		
Stageloader		1		
Crusher		1		
Face Conveyor		535 feet		
FaceConveyor Drives		2		
Emulsion system		1 set		
Electrical system		1 set		
Monorail system		1 set		
Control system		1 set		
Miscellaneous		Various		

	HIAWATHA EQUIPMENT LIST		EXCLUDED FROM SALE	
Equipment Category	Equipment Description	Status/Loc	Comment	Fair Market Value
	Trucks 106,109,110,111,112,114,115			
	IR Compressor	LW		
	488 Battery Scoop			
	6 Rebuilt shields			
	#1 Belt upgrade			
	Some computers			
	Some CSEs			

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Exhibit E-2 to
Order Authorizing Sale of Mine Assets
Free and Clear of all Liens, Claims, Encumbrances, and Interests
and Authorizing the Assumption and Assignment of Executory Contracts
Under 11 U.S.C. §§ 363 and 365

Transferable Permits and Licenses

See attachment.

Exhibit B
PERMITS AND LICENSES

Agence and Address	Permit/Licenses	Reference	ID#	Aproval Date
Utah State Division of Oil, Gas & Mining 1594 West Temple Suite 1210 Salt Lake City, Utah 84108-1203	Surface Mining Control and Reclamation Permit	Reclamation Permits	ACT/015/025	11/04/85
U.S. Environmental Protection Agency 999 18th Street, Suite 500 Denver, Colorado 80202-2405	Prevention of Significant Deterioration Permit (PSD) Spill Prevention Control & Countermeasure Plan	Clean Air Act Amendments of 1977 Federal Water Pollution Control Act	Potential emissions less than 100 tons per year. PSD not required	
State of Utah Division of Water Quality 288 North 1460 West P.O. Box 144870 Salt Lake City, Utah 84114-4870	Utah Pollutant Discharge Elimination System, Utah General Permit for Coal Mining Construction Permits for Sediment Ponds.	Utah Water Pollution Control Act	UTH040006	05/04/89 11/19/85 01/20/93
Utah Division of Water Rights 1636 West North Temple Salt Lake City, Utah 74116-0690	Stream Alteration Permits Water Rights Appropriation of Record of Diversion Dam Design Review	Section 73-3-29 UCA Section 73-5-12 UCA	92-93-02SA 00-93-01SA 01-93-07SA 93-3657 93-1067 92-93-16MD	09/02/92 04/10/02 08/28/02 07/02/92 07/25/86 04/13/
Industrial Commission of Utah 160 East 300 South SLC, Utah 84151	General Safety Notice of Intent to Mine coal	Orders Utah Coal Mines		
State of Utah Division of Air Quality 150 North 1950 West SLC, Utah 84114-4820	Air Quality Approval Order	Utah Air Conservation Regulation	DAQE-145-02	02/22/02
U.S. Department of Labor Mine Safety & Health P.O. Box 25367, D.F.C. Denver, CO 80225-0367	Mine Permit	Mine Safety and Health Act	42-01697 42-02095 42-02263 42-02335	09/27/80 03/09/94 12/14/99 03/08/02
U.S. Department of Interior, Bureau of Land Management, Moab Dist. P.O. Box 970 Moab, Utah 84532	Resource Recovery and Protection Plan Logical Mining Unit Birch Spring Lease -BLM	43 CFR 3482	UT-070 UTU-73342 U-50168	12/20/01 04/20/90
Emery County Zoning Commission P.O. Box 297 Castle, Dale, Utah 84513	Zoning Approval Emery County Road Use Agreement			04/07/80 06/20/01

E-7 CR

Exhibit F Revised 7-14-2010 to
Order Authorizing Sale of Mine Assets
Free and Clear of all Liens, Claims, Encumbrances, and Interests
and Authorizing the Assumption and Assignment of Executory Contracts
Under 11 U.S.C. §§ 363 and 365

Hiawatha Improvements
(part of Mine Assets)

Pile 4&1 Loadout belt housing/structures
Pile 4&1 Loadout belt scales
Pile 4&1 Loadout Belt Drive, Motor & Gearbox
Coal Sampler splitting System
Belt 1 upgrade including Gearboxes and lagging on drums
Belt 2 upgrade including Gearboxes and lagging on drums
Belt 3, upgrade including Gearboxes and motors replaced
Belt 4 upgrade including Fabric
Belt 4 Gearboxes and lagging on drums
Secondary Crusher
Tipple Control Room Door
Upper Crossover Belt Fabric
Dust Belt Drive
South Tower Belts gearboxes and motors
Air Compressor on Loadout
Tank for Air Compressor (53 North)
Richwood Air Wiper
Belt Structure hardware
Continental Controller
North Main Belt Drive & Wiper
Rebuilt Drive
13 hp Water Pump
1.5 hp Water Pump & controller
4 Left Belt Structure
4 left Belt Fabric
4 Left Water Line
Omega Blocks – 4 Overcasts
Rebuilt Controller
Parts and Supplies Inventory (Warehouse and Shop)
Tipple Welders
Desks (4)
Truck sensor system
Coal Sampling Room Heater
Rock Dust Air Compressor
Pile 4&1 Loadout Sweep Sampler
4 mine fan motors and controllers
New Roll Leaky Feeder Cable

Exhibit G Revised 7-14-2010 to
Order Authorizing Sale of Mine Assets
Free and Clear of all Liens, Claims, Encumbrances, and Interests
and Authorizing the Assumption and Assignment of Executory Contracts
Under 11 U.S.C. §§ 363 and 365

Assets of Hiawatha or Third Parties
(not part of Mine Assets)

3 Mine rescue chambers (partially purchased)
46 cap lamps purchased by Hiawatha
1 HP Plotter
7 computers purchased by Hiawatha (5 on the excluded list)
Truck 106 (excluded)
Truck 107 (excluded)
Truck 115 (excluded)
Truck 5 – Isuzu gas truck (excluded)
IR Air Compressor (excluded)
Longwall Cans
3 pallets cap pieces
4 pallets crib blocks
Box check frames
2 pallets crib blocks
Longwall cables (belongs to A-Fab)
Winch Controller (belongs to A-Fab)
Eimco 936 Bucket (belongs to A-Fab)
Longwall hose trailer (belongs to A-Fab)
Fuel Tank by 3 mine (belongs to Haycock)
89 Truck (owned by Mark Reynolds)
90 Truck (owned by Luke Brown)
Pneumatic Trailers (owned by Altco Trucking)
Chairs purchased by Charles Reynolds

13 Ocenco self rescuers purchased by Hiawatha
84 CSE self rescuers purchased by Hiawatha
12 Kenwood Radios
46 cap lamps purchased by Hiawatha

TAB 3

TAB 3

ORIGINAL

UNITED STATES BANKRUPTCY COURT
DISTRICT OF UTAH

IN RE:	Bankruptcy No. 08-20105
C.W. MINING COMPANY	Judge Mosier
Sale Order Objections to Be Addressed	

REPORTER'S TRANSCRIPT OF PREVIOUSLY-RECORDED PROCEEDINGS

DATE RECORDED: August 3, 2010

DATE TRANSCRIBED: August 12, 2010

TRANSCRIBED BY: Kelly L. Wilburn, CSR, RPR

APPEARANCES

For the Trustee:

MICHAEL N. ZUNDEL, ESQ.
RICHARD H. THORNTON, ESQ.
JAMES C. SWINDLER, ESQ.
PRINCE, YEATES & GELDZAHLER
City Centre I, Suite 900
175 East 400 South
Salt Lake City, Utah 84111
(801) 524-1000
(801) 524-1098 (fax)

For C.O.P., et al.:

KIM R. WILSON, ESQ.
P. MATTHEW COX, ESQ.
SNOW, CHRISTENSEN & MARTINEAU
10 Exchange Place, Eleventh Floor
Salt Lake City, Utah 84145
(801) 521-9000
(801) 363-0400 (fax)

For ANR and A Fab:

DAVID E. KINGSTON, ESQ.
LAW OFFICE OF DAVID E. KINGSTON
3212 South State Street
Salt Lake City, Utah 84115
(801) 486-1458
(801) 487-3971 (fax)

For C.W. Mining and Charles Reynolds:

RUSSELL S. WALKER, ESQ.
WOODBURY & KESLER, P.C.
265 East 100 South, Suite 300
Salt Lake City, Utah 84111
(801) 364-1100
(801) 359-2320 (fax)

For Rhino Energy:

GEORGE B. HOFMANN, ESQ.
PARSONS KINGHORN HARRIS
111 East Broadway, 11th Floor
Salt Lake City, Utah 84111
(801) 363-4300
(801) 363-4378 (fax)

APPEARANCES, CONTINUED

For Rhino Energy:

WILLIAM DOBBS, ESQ. (By telephone)

For Aquila:

BRENT D. WRIDE, ESQ.
RAY, QUINNEY & NEBEKER
36 South State Street, Suite 1400
Salt Lake City, Utah 84111
(801) 532-1500
(801) 532-7543 (fax)

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PROCEEDINGS

THE CLERK: C.W. Mining Company.

THE COURT: Will Counsel please note their appearances?

MR. ZUNDEL: Michael Zundel, Richard Thornton, James Swindler, and the Trustee are here, your Honor.

MR. WILSON: Good morning, your Honor. Kim Wilson and P. Matthew Cox here for C.O.P. Coal Development Company, Standard Industries, Inc., ABM Inc., World Enterprises, PPMC, Inc., Fidelity Funding, and Security Funding, Inc.

MR. KINGSTON: David Kingston appearing on behalf of ANR Company Inc., and A Fab Engineering.

MR. HOFMANN: George Hofmann appearing on behalf of Rhino Energy. I believe Williams Dobbs is also on the line attending by phone, your Honor.

MR. WALKER: Russell Walker on behalf of C.W. Mining and Charles Reynolds.

MR. WRIDE: Brent Wride on behalf of Aquila, Inc.

THE COURT: Mr. Dobbs, are you there this morning?

MR. DOBBS: Yes, I am, your Honor. Thank you.

THE COURT: Okay, welcome.

MR. DOBBS: Thank you very much.

THE COURT: This is the hearing set by the Court to consider the objections to the proposed order that was filed by counsel for the Trustee.

As an initial matter I note that Mr. Guyon, counsel for Hiawatha, has filed a motion to continue this hearing because he is out of town.

The Court is denying that motion, primarily because this hearing isn't necessary. The Court could prepare any order it chose without any input from the parties. Mr. Guyon has filed objections on behalf of Hiawatha, and I will address those objections this morning.

Perhaps the way that would make the most sense to address this is objection by objection. And the Court has some other modifications to the order. Those may come up during our discussions. To the extent that they don't, I will review those at the end to let the parties know, in general terms, what the order will be. And I anticipate the order will be entered later today.

Let's take, first of all, C.O.P.'s objection to the order. Their first objection is to paragraph 1, and that the proposed order states that

the sale motion is granted in its entirety, subject to limitations.

The objection, Mr. Wilson, as I understand it, is that there were modifications to the proposed sale motion made by the Court.

I believe that it is problematic if I don't say "in its entirety," because it leaves in question what didn't I approve. And I, I believe that my intent was to approve the sale motion as modified by the Court's findings of fact. So.

MR. WILSON: Noted, your Honor.

THE COURT: All right.

MR. WILSON: I'll, I'll say something other than noted if I --

THE COURT: Okay.

MR. WILSON: If, if the Court will allow me.

THE COURT: I will.

MR. WILSON: But, but noted on that. Thank you.

THE COURT: The second objection relates to paragraphs 10(a) and 10(b.) Paragraph 2(a) of C.O.P.'s objection objects to paragraph 10(b.)

The Court is going to delete paragraph 10(b.) And the reason is because -- and this will relate to other aspects of the order -- as part of the motion to

assume and assign, the Court has to make findings with respect to current breaches and adequate assurance of future performance.

The Court made those findings and conclusions. And the language that is contained in the proposed order in 10(b) is consistent with the Court's findings of fact and conclusions of law. But the Court has entered those findings of fact and conclusions of law.

And based on those findings of fact and conclusions of law the Court is going to order that the operating agreement may be assumed and assigned.

The problem I have with paragraph (b) is it reaches forward and addresses the potential breaches or requirements under the leases. And I don't think it is appropriate for the Court to order in advance whether there are breaches or not breaches or compliance.

So although the paragraph 10(b) is not inconsistent with the Court's findings of fact and conclusions of law, the Court's findings of fact and conclusions were law -- were with respect to adequate assurance of future performance, not actual future performance.

With respect to paragraph 10(a), C.O.P.'s

objection is correct in that the language is that C.O.P. has no veto power or right of control. And that's different than the right to participate in legitimate proceedings before federal agencies.

So I guess I'll hear from the parties. I think there would be two options: One is that the paragraph 10(a) is eliminated, or it is modified to include Mr. Wilson's language. And let me just ask the Trustee if he has any preference on those alternatives.

MR. ZUNDEL: May I have just a moment, your Honor?

THE COURT: You may.

(Pause.)

MR. ZUNDEL: We would leave it in, your Honor. And as long as it's clear that Mr. Wilson's proposed language does not undo what the Court is ruling but is simply allowing for the obvious, that is, lawful participation in future proceedings before the regulatory authorities, the Trustee has no objection.

MR. HOFMANN: Your Honor, I feel it's -- I need to address the Court to not allow silence on this or any other point be construed as an agreement by Rhino. Rhino bargained for a particular form of sale

order. The -- that was submitted originally with the motion. A modified version was submitted to the Court that Rhino was familiar with.

I'm not suggesting that Rhino will or will not accept any modifications the Court would make, and I'm not advocating here. But I would reserve Rhino's rights. Under the asset purchase agreement the sale order must be appropriate.

And I don't want my silence at this hearing to be construed as Rhino's acceptance of changes the Court may make to the order as submitted.

THE COURT: All right. And that -- noted, Mr. Hofmann. And I, I understand that Rhino made a bargain. That bargain was brought to the Court for approval. And the Court is approving that, to the extent that it believes it can and is appropriate. Hope --

MR. HOFMANN: I understand that.

THE COURT: -- hope -- okay. And so I think we're on the same page, Mr. Hofmann.

MR. HOFMANN: Thank you.

THE COURT: I, I would invite you, Mr. Hofmann, or Mr. Dobbs, or any other party, as I go through -- this will be the Court's order. The Court will make the ultimate determination. But if there is

a particular provision that is particularly important to a party, I'm happy to listen to concerns and see if those can be addressed.

MR. DOBBS: Your Honor, this is Bill Dobbs. And paragraph 10(b) is important. And if there is a way to reference the Court's decision in its findings in lieu of paragraph 10(b), that would perhaps help Rhino on that issue.

THE COURT: Well, Mr. Dobbs, I, I do think that the findings of fact and conclusions of law make it very clear that, that the Court's finding and conclusion of law was that, with respect to paragraph 5 -- which is commonly referred to as the "continuous operations paragraph" -- that what was required was compliance, substantial compliance. Essentially, keeping the leases intact, and mining in accordance with federal, state, and local laws.

I think that's very clear in the findings of fact and conclusions of law. And to one of the points or issues that the Court had with the proposed order is that, rather than constituting an order of the Court, it was essentially a restatement of the findings of fact and conclusions of law.

And so I, I think this paragraph is contained in the findings of fact and conclusions of law, so it

doesn't need to be restated. And then if it relates to future acts, I don't think that that's appropriate.

MR. DOBBS: Okay. Well, thank you, your Honor.

THE COURT: All right. So hopefully at least that clarifies my position.

MR. DOBBS: I understand.

THE COURT: All right, thank you.

The next objection is paragraph 14, and the word "substantial" or "substantially."

The Court, um. I need to apologize. I'm looking at a black-line version, and so I need to get the original order up so that I can make certain that I'm referring to the...

(Pause.)

THE COURT: The Court is going to delete paragraph 12, which refers to the Court's prior order and judgment. I'm not deleting that because I don't think it's appropriate, I'm just deleting it because it's there.

And I'm deleting paragraph 13, 14, and 15. And those are for the same reason that I stated before. While those paragraphs are consistent with my findings of fact and conclusions of law with respect to assumption and assignment and adequate assurance of

future performance, it's different if the Court orders after closing that the buyer is not in default under certain conditions.

The way that I see it -- and I understand this may be a concern for Mr. Dobbs and the Trustee. And I, I think what the buyer and the Trustee would like is for the Court to enjoin C.O.P. and ANR from contesting these issues in the future.

But I think what Section 365 contemplates is the Court authorizes an assignment and assumption of the lease, and the parties move forward. And, um.

So by the Court's deletion of those paragraphs I want to make it clear on the record that I am not, by any means, changing my position on the findings of fact and conclusions of law that the Trustee and the buyer have demonstrated adequate assurance of future performance, because they have demonstrated their ability to comply with applicable federal, state, and local laws. And the Court has determined that that's what's required by the -- paragraph 5 in the mine operating agreements.

MR. ZUNDEL: May I speak to that, your Honor?

THE COURT: You may.

MR. ZUNDEL: It's not an injunction we seek. It is an acknowledgment that once an issue has been

fully and fairly litigated, it has been decided.

THE COURT: Well, and I think the argument -- I, I think you're correct. And I think that the, that the Court has made its findings of fact and conclusions of law that the mine operating agreement, paragraph 5, requires compliance with applicable federal, state, and local law.

The distinction that I'm making, and the -- and what I think is problematic is projecting into the future whether there is compliance or not. If we were talking about a lease for a shopping mall the Court would approve the assumption and the assignment of the lease but wouldn't address issues about future defaults under the lease.

So I, I think that your argument is sound, Mr. Zundel. I think it's -- the argument is that it's res judicata, but I think that's an argument that is raised if there's an assertion that there is some breach under the operating agreements.

And I hope -- I mean, I, I don't know how I can make it any clearer that I -- what, what I believe is before the Court on assumption and assignments is whether there's a current default, and whether there's adequate assurance of future performance.

But by finding there's adequate assurance of

future performance the Court doesn't address or make determinations about future performance.

MR. ZUNDEL: May I speak to that? Your Honor, our, our position is, is the Court certainly does not apply the law to future facts. But that the Court, in order to determine whether future performance is likely, the Court has every right and should determine what performance in the future is required.

THE COURT: And I've done that.

MR. ZUNDEL: And we, we are very troubled by the landlord's objection to the word "substantial." We expect that the -- an assertion that every jot and tittle must be complied with or the -- there is a breach.

We do not think that that is the law. But we expect, given the objection and the nature of the litigation that we have had, to see that. And I think it would help if the Court would make clear that what the Court envisions is substantial compliance. That's all the law envisions.

And we can argue -- or Rhino can argue later, in another court, as to whether their future conduct meets that requirement.

THE COURT: Well, it would always be nice if

you could go back as a judge and clarify every issue. This is similar to the issue that Mr. Wilson raised in one of, one of his objections, where I said that if C.O.P. -- or excuse me, if the buyer complies with federal, state, and local law there is no breach under the operating agreement.

And Mr. Wilson said, Wait, wait. I don't think that's what you meant. What you probably meant is there's no breach under paragraph 5 of the operating agreement. And Mr. Wilson is correct.

And you, Mr. Zundel, are correct that when I said all that's required is compliance with federal, state, and local laws, what I meant by that is, for instance if there is a mine safety violation, that is not a failure to comply with federal, state, and local laws.

Now, failure to make any effort to remedy that might be. I can't imagine that there's any mine in the United States that operates without any type of infraction or violation. And --

Maybe I can make a supplement to my findings and conclusions to clarify Mr. Wilson's point and to clarify your point, Mr. Zundel. Because that's clearly what the Court intended.

MR. ZUNDEL: Thank you, your Honor.

THE COURT: So I've addressed one of your objections, Mr. Wilson. I'll skip it when we get to it.

MR. WILSON: Thank you, your Honor. Still recognize that you are the judge and have the agenda in hand.

THE COURT: All right. Paragraph 4 of C.O.P.'s objection, I understand part of that, I don't understand part of it, Mr. Wilson. The part that the order should include a reference to duties, I understand that. And I think it's appropriate to include that.

I don't understand the first part of the sentence that you propose, "except as provided herein with respect to encumbrances."

MR. WILSON: Your Honor, we would be pleased to delete from our proposed language the "except as provided herein with respect to encumbrances."

THE COURT: All right. The -- paragraph 5 of the objection objects to paragraph 26(k.) And C.O.P. believes that the order purports to sell appurtenant water rights of C.O.P.

I don't think that's what the order says. I think that the order says that what is being sold is appurtenant water rights, if any. And the Court

understands that the Trustee can't sell someone else's property.

What appurtenant water rights there are hasn't been determined. But as I understand it, Rhino's agreed that as part of the purchase, if there are appurtenant, appurtenant water rights, then Rhino has purchased those.

MR. ZUNDEL: Purchased the Debtor's right to use them. The Debtor and the Estate does not claim to own the appurtenant water rights. The Debtor -- the position of the Estate is, is that appurtenant water rights are real estate and are subject to the lease.

THE COURT: Well, and I think that that's covered by the "if any" provision under the order. Basically that's not an issue that the Court has addressed or ruled on. But if there are rights to use appurtenant water rights, those are being transferred to Rhino.

MR. ZUNDEL: We think the order is clear in that regard, your Honor.

THE COURT: The next objection --

MR. WILSON: (Inaudible.)

THE COURT: Yes?

MR. WILSON: Should we just say? Excuse me. I pushed the button.

THE COURT: No, go ahead.

MR. WILSON: Should we just say what Mr. Zundel just said, And the right to use appurtenant water rights? It's a nice clarification, as long as we're parsing words, to, to hear it.

MR. ZUNDEL: That's, that's what the first clause says. The Debtor's and its, and its Estate's right, title, and interest in the following, whatever that is. I mean, a leasehold interest is such a right.

MR. WILSON: A little clarification never hurt.

THE COURT: Well, what clarification would you be suggesting? I mean, paragraph (k) says, if you include the initial sentence that Mr. Zundel referred to, the Debtor's and Estate's right, title, and interest in appurtenant water rights, if any.

MR. WILSON: The only clarification -- and it would be up to the Court to determine if it's redundant -- is we would insert a proposed insertion at (k), "The right to use."

THE COURT: Well.

MR. WILSON: If, it it's redundant --

THE COURT: Well, I guess the problem with that is that also suggests that I've made some

determination as to what right there is.

MR. WILSON: Well, that's, that's the problem, is the Court's going somewhere that, that it really has no evidence on. We spent a lot of time in the prior hearing about appurtenant water rights and what was required.

And that's all sort of been -- no, no ruling was made. And we didn't spend any -- you know, take, take another half a day here (inaudible) --

THE COURT: Well, and I guess that if there's an issue, then it would be decided. If there are any.

MR. WILSON: Somewhere else, we presume.

THE COURT: Yeah. So the -- I, I think that the qualifier at the "appurtenant water rights, if any," is appropriate. And so I'm going to let that stand as it is.

MR. WILSON: And I'll say the word "noted" again and be quiet.

THE COURT: Okay.

MR. WILSON: Thank you.

THE COURT: Yeah, I'm not anticipating that by clarifying the order I'm going to be eliminating any potential for appeal.

Paragraph 6 of the objection goes to paragraph 34. The Court is going to retain that

provision, but I am going to modify the language.

Your objection, Mr. Wilson, was that the -- paragraph 34 suggests that it could be closed at any time in the future. It's gonna have to be closed soon. I don't think there's any question about that.

What I am going to do though, Mr. Zundel, is I'm -- the pr -- the order I intend to enter will state this: The buyer may waive any or all conditions precedent to the buyer's obligations, as set forth in the sale agreement, that have not been satisfied and proceed to close the transactions under the sale agreement.

I think that what was intended is, if the buyer wants to waive conditions, the buyer can waive conditions. I think it --

MR. ZUNDEL: Who is per -- who is performing?

THE COURT: Excuse me?

MR. ZUNDEL: Who the buyer's performing?

THE COURT: Correct.

MR. ZUNDEL: Yeah.

THE COURT: Yeah. The, the -- it -- the confusion I think there may have been is that the Trustee may waive any conditions. And I think what was intended is that the buyer may waive conditions precedent to its obligations to close.

MR. ZUNDEL: Yes, that's right.

THE COURT: With respect to paragraph 7 of the objection, objecting to paragraph 39 subsection (d), I'll change "and" to "or."

Paragraph 44(k), that's the next objection by C.O.P. I'm eliminating that paragraph. The -- I think it's clear -- and I'm, I'm willing to consider some language if it's concerning for Rhino. I think that it's clear that Rhino is not assuming any obligations for environmental conditions that are existing on the property at this time.

The problem I have is I don't know that the EPA or other regulatory agencies have been given notice that the, the environmental conditions are going to be characterized as claims and how they're going to be treated.

I think they can be characterized as claims. But the EPA may have the ability to require certain parties to clean up those conditions. And this is a -- while we're on this topic, it's related to an objection raised by ANR with respect to the reclamation bond. That the buyer needs to post the reclamation bond.

I think there's two issues here: One is whether there needs to be a bond in place by someone,

and whether the buyer needs to do something. So in other words the, the intent of this order is that the assets are sold to Rhino free and clear of claims and interest. And free and clear of any obligation to ameliorate or correct environmental conditions.

That's a different issue than if, in its procedure or process of obtaining permits, a governmental agency says to Rhino, You are gonna have to do something.

And I, I mean, I just, I -- it's pure speculation, but it's conceivable that someone might say, Well, if you want a permit you're gonna have to go and clean up that pile over there. And I don't care whose responsibility it is, but to get your permit you're gonna have to do that.

And I, and I see a distinction between those two.

MR. ZUNDEL: May I speak to that, your Honor?

THE COURT: Yes.

MR. ZUNDEL: The, the question is, is what is Rhino contractually assuming? Which is completely different from what any federal regulator or state regulator may require. And there is no intent that this doc -- this order will impinge upon what federal and state regulators must do.

But it is important that it be clear as to what -- and the Court recognize what Rhino is contractually doing and not doing. And for that reason, we would ask that paragraph (k) remain.

The, the parenthetical, "Except environmental conditions arising out of the reclamation required by permits, et cetera," recognizes, we hope, what I just said. And I think addresses the Court's concern that what Rhino is looking for is cover from this Court in dealing with, with regulators in the future. And that's not true.

MR. WILSON: May I speak to that, your Honor?

THE COURT: You may.

MR. WILSON: I think perhaps the Court was near the end of its hypothetical. But if the EPA or other regulatory agency requires something of Rhino, then they ought to do it. And, and if, if that's clear, then we're fine.

THE COURT: Would there be an objection -- recognizing, Mr. Hofmann, and Dobbs, and Mr. Zundel, we're only talking about this paragraph, having noted what Mr. Hofmann said before.

But it might be clearer and might alleviate my concerns if we, rather than having (k) be a subset of what is -- the Court is determining is an

encumbrance, that we set it forth as a separate paragraph just expressly stating that Rhino is not assuming any responsi -- I think it's --

What I'm struggling with is it's a little bit different for this Court to determine that these are claims, and therefore encumbrances, and that they're somehow impacted by this order the same as a secured creditor asserting a claim against the assets.

And --

MR. ZUNDEL: Well --

THE COURT: -- basically the, the EPA has certain rights, powers, and authorities to clean up messes. And I think it's clear Rhino's not assuming the Debtor's or anyone else's obligation to clean up a mess.

MR. DOBBS: Your Honor, this is Bill Dobbs. We would rather have the Court say that Rhino's not assuming any obligations than the Court not deal with the issue at all.

But the -- we were hoping to have a provision in (k) -- the provision in (k) stand, because we believe that there was adequate notice given to all parties for the last three or four months that this is what the order was going to be -- this was the order that was gonna be sought from the Court.

I, I don't think there should be an issue about notice. But if the Court is not going to keep (k) where it is, then it would be better than nothing to have a provision that says that, that Rhino is not assuming those obligations.

THE COURT: All right.

MR. WILSON: Your Honor -- (inaudible) may I be heard?

THE COURT: Yes.

MR. WILSON: Or should -- is this the right time for me to be heard on that? Was the Court about to announce its decision?

THE COURT: I was about to announce that I'm gonna think about this one a little bit more. So you can say what you want to say, Mr. Wilson.

MR. WILSON: All right. Well, it won't be much. But, but that is, if EPA or DOGM says, Before we give you the permits you gotta do X, Y, Z, then it needs to be clear that Rhino's gotta do X, Y, Z.

And I, I believe that's what -- I think we're all going the same direction. But we've got to -- you can classify the, the obligation as it presently exists as a claim that -- at least that's what you're being sold free of.

But it's very problematic for the Court to

tell DOGM or EPA what its, what its rights are with regard to certain requirements for permitting.

THE COURT: Well, and I -- that's exactly my concern, Mr. Wilson.

MR. WILSON: Right. Okay.

THE COURT: And what I --

MR. WILSON: As long as it's --

THE COURT: What I --

MR. WILSON: -- clear, and I --

THE COURT: And what I will think about and consider with respect to paragraph (k) is whether it can be interpreted as an order of this Court to the EPA or DOGM as to what they should or shouldn't do.

MR. WILSON: And C.O.P. can --

THE COURT: As opposed to clarifying that Rhino is not assuming any of the Estate's or someone else's obligations to clean up any environmental problems.

MR. WILSON: Thank you, your Honor.

MR. HOFMANN: May I be heard very briefly on this, your Honor?

THE COURT: Yes.

MR. HOFMANN: I, I would just say -- and obviously we're hearing this for the first time. The Court's concerns. And I think the Court's concerns

are, are appropriate. But I would say, from the buyer's perspective, this isn't the first time a potentially environmentally-compromised asset has been sold in a bankruptcy court.

And it's a material issue, from the buyer's perspective, whether there's any liability. There's a reason buyers come to the bankruptcy court and they're willing to pay, in this case, top dollar for the assets.

And that is, through the bankruptcy court you can obtain assets free and clear of liens, claims, and interests in a way that you can't in any other forum that I'm aware of.

Not having had the opportunity to address this in advance, this particular issue, I would submit that the Court does have the authority to sell free and clear of claims that would include environmental claims.

And that if Rhino were potentially subject to unlimited future liability for environmental claims based on events that it had nothing to do with, that very well could be a material issue that could cause Rhino not to choose to close.

MR. WILSON: In response, this Court probably doesn't have authority to tell DOGM and EPA what

they're gonna require. And that's problematic with environmental. And, and we take exception to the statement that the Court can control that.

MR. ZUNDEL: Might I -- a couple of things, your Honor. Number one, I think that there is a -- I can tell from Mr. Dobbs's comments that Rhino thinks that there may be an argument that the EPA might be bound.

If that is true, then it is true. And if it's not, it's not. And that argument can certainly abide another day, it seems to me. So I, I don't know that the Court needs to be concerned.

Now, the other thing that I think substantively in the order, I've been -- it's just been pointed out to me, paragraph 36 and paragraph 57 also touch on this issue. And may resolve the Court's problem.

And I, I would invite Mr. Swindler or Mr. Thornton to walk the Court through that. It will just take a second.

MR. THORNTON: Your Honor, in paragraph 36(d) the buyer affirmatively takes these mine assets, subject to claims of governmental entities for reclamation and environmental cleanup from preexisting conditions.

That, that is laid out affirmatively in paragraph 36(d) and clarified. So that's another part of the order. Not part of the definition of encumbrances, but rather a listing of those liabilities to which they take subject.

That's -- I hope I have the same paragraph numbering. This is from an older version.

MR. WILSON: Thirty-six(d)?

MR. ZUNDEL: Thirty-six(d.)

MR. THORNTON: Yeah, 36(d.) And then paragraph 57 has a general statement for Rhino's --

THE COURT: Thirty -- 36(d)?

SPEAKER UNKNOWN: Yeah (inaudible.)

MR. ZUNDEL: It's not a sub --

MR. DOBBS: Your Honor, he's referring to paragraph 39(d) in the (inaudible) --

MR. THORNTON: Excuse me, my numbering of it is incorrect, that's 39. Thank you, Mr. Dobbs.

THE COURT: Okay.

MR. THORNTON: So 39(d.) I have a prior version I was looking at.

MR. WILSON: Sorry, I think we added to the confusion.

MR. ZUNDEL: (Inaudible) 57, what's 57 now.

MR. THORNTON: All right. So that's 39(d) is

that reference. Then the other reference is just a general disclaimer.

THE COURT: Well, then why aren't 39(d) and 44(a) conflicting?

MR. DOBBS: Your Honor, I believe that some courts have held that certain of the claims can, can actually be quantified. There is a body of law that says that environmental claims, if they can be fixed, are deemed to be claims.

And therefore, to the extent that those would be deemed to be claims, then that would conflict with, with paragraph 39(d.)

And we, we believe that the law is that the Court can, can determine that claims that, that can be quantified in money terms are claims that can be sold free and clear of.

MR. ZUNDEL: So I suppose the question -- that would be something to be argued about later as to whether paragraph (k) or whether paragraph 39 is, is the applicable paragraph.

SPEAKER UNKNOWN: Okay.

THE COURT: Let's move on. I, I understand Rhino's concern. I, I am concerned about having an order that would be inconsistent in its provisions, so maybe I don't want to move on. I need to --

MR. ZUNDEL: It's not inconsistent, your Honor. It depends on the, the nature of the claim. What Rhino -- as I understand what Rhino is doing -- and maybe Mr. Dobbs will correct me -- is simply anticipating that a claim may come forward which should have been brought as a claim in this Court, in which case 39(b) would apply.

If it is such a claim that it was not ripe to be brought in this Court because it cannot be monetized, then the other paragraph would apply. That is how I understand it.

MR. DOBBS: Yeah. Mr. Zundel has said that very, very well from my standpoint, your Honor. If, if, for example, there were water leaching from an area and that water was creating an environmental hazard, I would think that would come under (d.)

If there was a pile of, of garbage that had some problematic chemicals in it, then I think that is the sort of thing that could be quantified as a, as, as a claim.

THE COURT: Do you have the order, Mr. Dobbs?

MR. DOBBS: I, I have, I have the order that we've submitted to the Court.

THE COURT: Okay. So if we look at paragraph (k), near the middle, it states: "Such

conditions and obligations are claims." If we change that to "may be claims"?

MR. DOBBS: Yeah, that would, that would certainly be better, your Honor, than deleting it.

THE COURT: Because if, if I understand the argument is we right now today, we may not know whether there are claims or not.

MR. DOBBS: I, I think that's correct, your Honor.

THE COURT: Okay. All right. So I think I'm willing to keep paragraph (k) if we say "may be claims." And then to the extent that they are determined to be claims, then Rhino is purchasing the assets free and clear of those claims.

MR. DOBBS: That's -- thank you, your Honor. That's, that's what I understand.

THE COURT: Okay. All right, paragraph 9 -- should have known this was gonna take longer than an hour, but.

Paragraph 46. I don't see a problem with paragraph 46, in that -- basically it says: Effective on the closing all persons and entities, to the extent allowed by law, are forever prohibited and enjoined from commencing or continuing in any manner any action or other proceeding.

But all of that is qualified by: "Based upon or with respect to any encumbrances." And "encumbrances" is a defined term. And so I think it's clear that paragraph 46 is that, on closing, parties are enjoined from -- that a party who holds an encumbrance, as defined in the order, is enjoined, prohibited from continuing an action against the assets that are being sold. So I'm gonna leave 46 the way that it is.

The next objection is to paragraph 60. And that is the jurisdictional issue. And that issue has been raised in several objections, and -- well.

SPEAKER UNKNOWN: (Inaudible) paragraph 10?

THE COURT: Oh yes, paragraph 10. I, I apologize. That is...

I'm gonna leave 60 the way it is. I think 60 contemplates and provides that there might be immaterial and not substantial modifications. I think the objection is, Well, there shouldn't be. That everything should be brought back to the Court if there's any modification.

And I think that the buyer and the Trustee bear the risk of determining whether something's material or not. And if they're confident that it's not material, then they wouldn't come to the Court.

If they are confident it is, they would come to the Court.

If they had a question, if I were them, I'd come to the Court. So I'm gonna leave 60 the way it is.

Sixty-five is the objection to paragraph 60 -- paragraph 11 objects to paragraph 65, which is the jurisdictional objection. I don't think that it is overly broad, except for (c) -- excuse me, (d.)

The end of (d), reading in connection with the first sentence of paragraph 65, would say that this Court shall retain jurisdiction, even after closing of this case, to insure the peaceful use and enjoyment of the mine operating agreement or the mine assets by the buyer.

I do think that is overly broad. But I do think that the Court has jurisdiction to do that while the case is pending. So by eliminating that sentence I'm not suggesting the Court doesn't have jurisdiction to address that issue. It's just after the case is closed I think that may be overly broad.

But other than that, I think all of the jurisdiction that the Court is retaining relates to the sale order, sale motion, the assets, and the

parties' rights under the asset sale agreement.

MR. ZUNDEL: Does it make sense simply to add the words "until the case is closed"?

THE COURT: I don't have any problem with that. You mean at the beginning of paragraph 65, or with respect there?

MR. ZUNDEL: Yeah.

THE COURT: Yeah. I would leave the language in that I said I would delete if the first sentence of paragraph 65 were changed that: The Court shall retain jurisdiction until this case is closed to address those issues.

MR. ZUNDEL: We would prefer that, I think, your Honor.

THE COURT: All right. The Court will do that.

Paragraph 12 is the objection to -- that I discussed earlier. Mr. Wilson's clarification of paragraph 45 of the findings of fact. It doesn't really go to the order. I may supplement my findings of fact to clarify that.

And as I said, Mr. Wilson, you're correct in that reading.

MR. ZUNDEL: With, with respect to the supplemental findings, your Honor, does the Court want

us to submit something to remind the Court of these two or three issues that we have dealt with?

THE COURT: I can remember those two issues I've dealt with so far.

MR. ZUNDEL: Okay.

THE COURT: With respect to paragraph 13 of the C.O.P. objection, I think the conclusions of law and the findings of fact make it clear that this Court is not attempting to infringe on the -- any federal, state, or local agency with respect to their responsibilities.

And I think I made that abundantly clear on the record, so I don't think we need to include additional language on that. Although the additional language, I don't know that it would be prejudicial.

Mr. Wilson also filed an objection on behalf of Standard Industries, ABM, Fidelity Funding, Security Funding, and World Enterprises, and PPMC.

I've reviewed the list of the disputed assets. I, I think the -- oh, the -- I, I did -- I am eliminating from the order the statement that the Trustee is reserving his rights. Only be -- and not because the Trustee's not. I can clearly understand that that's what the Trustee is doing.

But this is an order. And I'm not ordering

the Trustee to retain his rights, so I'm gonna strike that language. But it doesn't mean that the Trustee is not retaining his rights, whatever they are. The order just isn't going to that issue.

All right, turning to the ANR objection. I've -- Mr. Kingston, I've already discussed and tried to clarify the Court's position with respect to requirements by federal, state, and local agencies. And that is that the buyer is not assuming responsibilities of other entities, or bonding, reclamation, and similar liabilities.

But if one of those agencies says to the buyer that they need to do something, then the buyer would need to do that. And I think that that was the buyer's testimony, that they would do what they needed to do to maintain the lease and operate the mine.

MR. KINGSTON: And that's fine. That's what ANR's position is. Thank you.

THE COURT: With respect to paragraph 3, the -- you take some issue with the misrepresentation -- there was a misrepresentation by Mr. Reynolds. I didn't -- "misrepresentation" doesn't mean that it was fraudulent or intentional. It can be negligent, it can be a mistake.

And I think Mr. Reynolds' testimony was if he

had known that the 60 acres wasn't contiguous, he wouldn't have included it. So I don't, I don't see an issue there. It just simply says "misrepresentation," and, and there was no finding of whether it was bad faith, or negligent, or a mistake. But it was a misrepresentation.

MR. KINGSTON: I think the only clarification there was whether the misrepresentation was made on behalf of ANR or the Debtor. And our assertion is that that was made on behalf of the Debtor by Mr. Reynolds.

I believe the findings may have indicated that was made on behalf of ANR, so that clarification was inserted for that reason.

MR. ZUNDEL: Well, it's erring -- ANR that represents what property they're leasing to the Debtor.

THE COURT: Objection to paragraph 4, that object -- objection will be addressed in a similar way that C.O.P.'s objection will clarify that it doesn't prohibit ANR from participating in any legitimate process.

Objection 5 has been addressed. Objection 6 has been addressed. Seven has been addressed. Eight, 9, 10, 11, 12, 13, I believe have all been addressed.

And 14. Those are essentially the same ones that Mr. Wilson had raised.

Fifteen has also been addressed. That's the language I don't know that is necessary, but wouldn't be prejudicial.

All right, so here is -- A Fab has a request for clarification of paragraph 113 of the findings. I think the -- I reviewed that, and I...

I'm going to leave the finding of fact and conclusion of law. And the reason is because the finding of fact is that the longwall system might be an asset that the Trustee can recover. It might not be.

So it simply states that it might be. So I'm -- it doesn't determine definitively that there was a sale leaseback arrangement. It's an allegation that was made.

MR. KINGSTON: Thank you, your Honor.

THE COURT: And I have considered the objections by Hiawatha. I'm not gonna go through those in detail because Mr. Guyon isn't here anyway. But I'm not going to make any changes to the order, other than those that I've already addressed, based upon Hiawatha's objection.

So I think that addresses the objections.

Now with respect to -- along the lines of the issues I raised before with respect to ruling on issues prospectively under paragraph, it is paragraph 11, talking about the nonmonetary and other defaults under the ANR mine operating agreement.

The paragraph (b), I am adding at the end of that paragraph -- and unfortunately there's not a bright-line test as to whether something's a ruling on a future action or not. But I am going add: "And buyer has no obligation to maintain the ANR federal co-lease as it pertains to the 60-acre parcel."

But I am going to delete paragraphs (d), (e), and (f.) I think those are the types of orders and rulings that I was expressing concern about with respect to future operations, and applying production on the C.O.P. Coal lease to the ANR coal lease.

MR. ZUNDEL: Can I speak to that, your Honor?

THE COURT: You may.

MR. ZUNDEL: (C) for exam -- (e) for example, this again is -- we're asking the Court to interpret and -- the obligations of the operator under the ANR agreement. C.W. Mining has never had a permit in its own name to operate that property.

The evidence -- and this, this language that we have there has been found by Judge Boulden. And it

was also part of your Fact 71 -- Finding of Fact 71. And it is important because -- just to remind the Court of the facts -- Hiawatha told DOGM that they were operating the ANR property as basically the agent or servant of the Debtor.

THE COURT: All right. I'm, I'm willing to leave paragraph (e), because I do believe that it relates to any current default and adequate assurance of future performance. (D) and (e) I think are different.

MR. ZUNDEL: D and (f), you mean?

THE COURT: D and (f), yes. I'm sorry.

MR. ZUNDEL: Well, I took the easiest one to argue.

THE COURT: And you won on that one.

MR. KINGSTON: Your Honor, I think --

THE COURT: What was --

MR. KINGSTON: Excuse me, I'm sorry. Can ANR be heard on that paragraph (e)?

THE COURT: Yes.

MR. KINGSTON: What -- I guess ANR's concern there is what if the permit is required by DOGM, or BLM, or somebody, even next week or tomorrow?

THE COURT: Well, I think it's pretty clear. If a governmental agency says there has to be a

permit, then Rhino's gonna have to get a permit.

MR. KINGSTON: Okay, thank you.

THE COURT: What, what this is saying is that under the ANR agreement, the agreement doesn't require a permit prior to mining activity. Now, if a government agency says there is, then a government agency says there is.

I am deleting what is paragraph 21. Not because it's not true, but because it's already included in the findings of fact and conclusions of law. And based upon the satisfying -- satisfaction of those requirements, I'm ordering and authorizing the assumption and assignment.

Last -- similarly, I'm removing paragraph 29 because, again, it's not an -- part of the order. (Inaudible.) I mean, that, that is what it is. The Court made its ruling in that case, and I don't think it's necessary to be part of this order.

And I think -- oh, paragraph 45 I am modifying. I think the intent is and I'm leaving the -- I'm modifying the first sentence. It says:

> "In the absence of provisions of this order the buyer would not have purchased the mine assets."

I don't think that's appropriate as part of

the order. What the order will read is:

"Buyer is giving substantial consideration under the sale agreement for the benefit of the holders of encumbrances. The consideration given by buyer shall constitute valid and val -- valuable consideration for the releases of the encumbrances."

And continuing on. So it's not a substantive change on that.

And paragraph 53 is being modified very slightly. Where it says: "Encumbrances of any kind," "encumbrances" is a defined term under the order. So I'm just saying: "All parties holding encumbrances," and striking "of any kind."

And paragraph 58, I'm changing "directed" to "authorized." I'm not satisfied that every federal, state, and government agency has gotten notice that authorizes me to direct them to act in a particular way, but they are authorized.

So those are the modifications to the order that I intend on making.

MR. ZUNDEL: Thank you, your Honor.

THE COURT: Thank you.

MR. WILSON: Thank you.

MR. KINGSTON: Thank you, your Honor.

(End of recording.)

CERTIFICATE

STATE OF UTAH)
) ss.
COUNTY OF SALT LAKE)

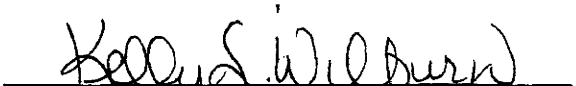
This is to certify that the foregoing transcript was prepared by me, KELLY L. WILBURN, a Certified Shorthand Reporter and Registered Professional Reporter in and for the State of Utah.

That the transcript was prepared from a previously-recorded proceeding at which I was not personally present; therefore, the quality of said recording may affect the quality of the transcript.

That said recording was then written in stenotype by me and thereafter caused by me to be transcribed into typewriting. And that a full, true, and correct transcription of said recording so taken and transcribed to the best of my ability is set forth in the foregoing pages, numbered 1 through 44, inclusive.

I further certify that I am not of kin or otherwise associated with any of the parties to said cause of action, and that I am not interested in the event thereof.

SIGNED ON THIS **12th** DAY OF **August, 2010.**



Kelly L. Wilburn, CSR, RPR
Utah CSR No. 109582-7801

TAB 4

TAB 4

United States Department of the Interior

BUREAU OF LAND MANAGEMENT

Utah State Office
P.O. Box 45155
Salt Lake City, UT 84145-0155
http://www.blm.gov

TAKE PRIDE IN AMERICA

Sandra
1-7-11
1/10/11

IN REPLY REFER TO:
3482
UTU-73342 (LMU)
SL-025431 (Coal Lease)
SL-069985 " "
UTU-024316 " "
UTU-024318 " "
UTU-46484 " "
UTU-020668 " "
UTU-38727 " "
UTU-51923 " "
UTU-61048 " "
UTU-61049 " "
(UT-923)

JAN 07 2011

Certified Mail--Return Receipt Requested
Certificate No. 7009 0820 0001 7945 3672

Corey A. Heaps
Castle Valley Mining LLC
2352 N. 7th Street, Unit B
Grand Junction, CO 81501

Re: Approved – Modification to the Resource Recovery and Protection Plan (R2P2), Continuous Miner Pillar Panels, Castle Valley No. 3 and No. 4 Mines

Dear Mr. Heaps:

The Bureau of Land Management (BLM) received on December 14, 2010, a Resource Recovery and Protection Plan (R2P2) modification request from Castle Valley Mining LLC for the subject mines. The proposed modification revises the mine layout in the Tank Seam by changing the mining method from longwall mining (approved July, 2006) to room-and-pillar mining. This revision will result in a change to the layout, timing, and recoverable tonnage projection for Castle Valley Mining LLC's Logical Mining Unit (LMU) #UTU-73342 which includes Federal coal leases SL-025431, SL-069985, UTU-024316, UTU-024318, UTU-46484, UTU-020668, UTU-38727, UTU-51923, UTU-61048, and UTU-61049. Current mining is in the Tank Coal Seam. This mine was most recently inspected by the BLM on October 26, 2010.

Background: On August 25, 2010, the "Assignment and Assumption Agreement" between the trustee of the bankruptcy estate of C. W. Mining and Castle Valley Mining LLC was signed. Castle Valley Mining LLC acquired the COP and ANR Operating agreements and is now the operator of the Castle Valley No. 3 and 4 Mines. The previously approved R2P2 for these mines

described a combination of room-and-pillar and longwall mining methods to mine the various seams in the Logical Mining Unit. This Modification revises the mining of the Tank Seam only to room-and-pillar mining by continuous miners and a modified projected access to the Mohrland area. Mine plans and mining methods for the other seams in the LMU are not affected in this Modification. Mining and timing sequencing remains the same for the LMU mineout.

Proposed Plan: Room-and-pillar mining offers more flexibility when seam conditions do not match equipment operating parameters or adverse geological conditions such as sandstone channels, rapid structural changes, or quality deteriorations are encountered. To reflect the change of mining method, the Tank Seam mine plan has been modified. Castle Valley Mining LLC plans to finish driving the three-entry gateroad (old 4th West) to the furthest extent possible to the west and then develop rooms and pull pillars to the south leaving a barrier to the old 3rd West. The Mains will continue to the north to the point where a set of submains will be driven to the west and room-and-pillar panels developed and extracted. It is anticipated that the room-and-pillar mining method will be more favorable to extracting the Tank Seam with its variations in geology and seam thickness unconformities.

The reasoning behind this plan change is there is a better likelihood of being able to maximize coal recovery. The plan also opens the mine up to develop panels for room-and-pillar retreat mining with the possibility of adding additional continuous miner units.

Approval:

The modified R2P2 approval is a based on:

1. No additional surface breakouts.

2. Mining of the economically and safely recoverable coal to a minimum minable coal thickness of five feet.

Additional information required by the BLM upon receipt by Castle Valley Mining includes:

1. Barrier size calculations along the Mains and between mining districts are to be provided before retreat mining commences.

2. A copy of the approved pillar recovery plan once approved by MSHA.

The plan allows for development of panels for retreat mining and also provides for expanded areas of room-and-pillar mining recovery. The BLM hereby approves the revisions to the R2P2. A copy of the approved mine map is enclosed.

Maximum Economic Recovery (MER): Full extraction of recoverable coal reserves will enable MER of LMU #UTU- 73342 to be achieved. In addition, continuous miners allow the mining of higher quality coal as mining near outcrop and burn areas can be more selective an adaptive to the outline of the minable coal thickness.

Recoverable Reserve Base: The current recoverable coal base for LMU #UTU-73342 is 50.67 million tons. The proposed modification to the room-and-pillar mining method from the prior longwall mining method in the Tank seam reduces the recoverable coal base by 1.68 million tons due to the projected recovery change. The projected remaining recoverable coal base for the Tank Seam is 9.6 million tons and the recoverable coal base for LMU #UTU-73342 is 48.99 million tons.

This difference of 1.68 million tons assumes all of the longwall panels planned for extraction in the prior R2P2 would be recovered. However, the actual longwall mining encountered a thinning of the coal seam due to a sandstone intrusion which substantially affected minability and coal quality. Longwall Panel 3 Left required disposal of rock encountered in rock rooms that were cut into Longwall Panel 4 (not approved by the Authorized Officer), reducing the recoverable 4 Left longwall panel by some 10%. If actual adverse mining conditions would have continued to be encountered with longwall mining in the Tank seam, some 1.4 million fewer tons would have been recovered under the prior R2P2 plan. This leaves a remaining difference between the prior longwall R2P2 plan and the proposed continuous miner plan of some 0.3 million tons which is well within the accuracy of recoverable tonnage projections based on known geologic mining conditions.

National Environmental Policy Act (NEPA): No new surface disturbance is predicted with this action, and therefore this action is Categorically Excluded (CX) from NEPA analysis under DM 516 chapter 11.5, paragraph F. (8): Approval of minor modifications to, or minor variances from, activities described in an approved underground or surface mine plan for leasable minerals (e.g., change in mining sequence or timing).

Appeal Process: This decision may be appealed to the Interior Board of Land Appeals, Office of the Secretary, in accordance with the regulations contained in 43 CFR, Part 4, and the enclosed Form 1842.1. If an appeal is taken, your notice of appeal must be filed in this office (at the above address) within 30 days from receipt of this decision. The appellant has the burden of showing that the decision appealed from is in error.

If you wish to file a petition (pursuant to regulation 43 CFR 4.21)(58 FR 4939, January 19, 1993) (request) for a stay (suspension) of the effectiveness of this decision during the time that your appeal is being reviewed by the Board, the petition for a stay must accompany your notice of appeal. A petition for a stay is required to show sufficient justification based on the standards listed below. Copies of the notice of appeal and petition for a stay **must** also be submitted to each party named in this decision and to the Interior Board of Land Appeals and to the appropriate Office of the Solicitor (see 43 CFR 4.413) at the same time the original documents are filed in this office. If you request a stay, you have the burden of proof to demonstrate that a stay should be granted.

Standards for Obtaining a Stay

Except as otherwise provided by law or other pertinent regulation, a petition for a stay of a decision pending appeal shall show sufficient justification based on the following standards.

(1) The relative harm to the parties if the stay is granted or denied,

(2) The likelihood of the appellant's success on the merits,

(3) The likelihood of immediate and irreparable harm if the stay is not granted, and

(4) Whether the public interest favors granting the stay.

This R2P2 modification complies with the Mineral Leasing Act of 1920, as amended, the regulations at CFR 3480, and the lease terms and conditions. If you have any questions, please contact Steve Falk in the Price Field Office at (435) 636-3605 or Jeff McKenzie of my staff at (801) 539-4038.

Sincerely,

Roger Bankert
Minerals Branch Chief

Enclosure:
Form 1842-1
Approved Mine Maps

cc: UT-070, Price Field Office (w/ Enclosure)
Utah Division of Oil Gas and Mining (w/ Enclosure)
1594 West North Temple, Suite 1210
Salt Lake City, Utah 84114-5801

TAB 5

TAB 5

KIM R. WILSON, Utah State Bar No. 3512
DAVID L. PINKSTON, Utah State Bar No. 6630
SCOTT H. MARTIN, Utah State Bar No. 7750
P. MATTHEW COX, Utah State Bar No. 9879
SNOW, CHRISTENSEN & MARTINEAU
10 Exchange Place, Eleventh Floor
Post Office Box 45000
Salt Lake City, Utah 84145-5000
Telephone: (801) 521-9000
Facsimile: (801) 363-0400
Attorneys for COP Coal Development Company

UNITED STATES DEPARTMENT OF THE INTERIOR

OFFICE OF HEARINGS AND APPEALS
Interior Board of Land Appeals
801 North Quincy Street, Suite 300
Arlington, Virginia 22203

IBLA 2011-112 **COP COAL DEVELOPMENT COMPANY** **RE: January 7, 2011 Decision Approving Modification to Resource Recovery and Protection Plan ("R2P2"), Continuous Miner Pillar Panels, Castle Valley No. 3 and No. 4 Mines**	**DECLARATION OF CHARLES REYNOLDS** UTU-73342 (LMU), et al. Coal Lease

CHARLES REYNOLDS, being first duly sworn, upon oath and upon penalty of perjury, declares as follows:

1. I am over 18 years of age and have personal knowledge of the facts set forth herein, except as to those matters that are stated on information and belief.

2. Prior to its involuntary bankruptcy, I was the President of C.W. Mining ("CWM").

3. I received a bachelor's degree from the University of Utah in mining engineering in 1991.

4. I have been involved in mining and mining operations since 1991:

a. From 1991 to 2001, I was the Chief Mining Engineer of CWM.

b. From 2001 to 2004, I was the Human Resource Manager for CWM; and

c. From 2004 to 2008, I was the Mine Manager, managing all aspects of the mining operation for CWM.

d. From July 2008 to February 2010, I was the Mine Manager for Hiawatha Coal Company, Inc., purported successor to CWM under federal lease.

5. I hold a current professional engineer ("PE") license from the State of Utah, which I received in 1997.

6. I hold a current Fireboss certification, which I received in 1996.

7. CWM was the operator of the Castle Valley Mine (aka Bear Canyon Mine) (the "Mine") under federal coal leases issued to C.O.P. Coal Development Company ("COP").

8. COP and ANR Company. Inc. own fee coal and federal coal leases in the Mine logical mining unit ("LMU").

9. I was involved in every aspect of the operation of the Mine from 2004 until February 2010.

10. As part of my responsibilities, I became very familiar with the LMU, including the Tank Seam and the Hiawatha Seam.

11. I also became very familiar with the coal resources, mine conditions, geologic environment, and mining methods in the Tank Seam and Hiawatha Seam.

12. I am very familiar with a number of coal mining methods, including room and pillar and longwall, and have employed them in my own mining practices.

13. I have studied and researched such methods. I provide herewith, at Tab A, a sample of my research and professional materials related to the risks and concerns associated with multiple and/or overlaying room and pillar mining operations in proximate seams.

14. Based on this research and my personal professional experience, multi-seam overlaying room and pillar mining operations are accompanied by a host of risks and concerns, including, without limitation: stability failures (roof and floor), pillar bumps, mine bursts, and excessive subsidence – all of which likely result in loss of coal reserves and higher operation costs.

15. I have carefully reviewed that Resource Recovery and Protection Plan ("R2P2") modification request submitted to the United States Bureau of Land Management ("BLM") by Castle Valley Mining, LLC in January of 2011. In that R2P2 modification request, Castle Valley Mining states its plan to change mining methods in the Tank Seam from longwall to room and pillar.

16. I have carefully reviewed the BLM's decision, dated January 7, 2011 approving this requested modification (the "BLM Decision") in mining method.

17. Based on my education, research and study, professional experience, and empirical experience working with and in the Tank Seam and Hiawatha Seam, it is my opinion

that a change in mining methods in Tank Seam will have effects on the Hiawatha Seam which is located below the Tank Seam, and the Tank Seam itself.

18. Specifically, changing from longwall to room and pillar method in the Tank Seam will have a direct effect on the maximum economic recovery ("MER") from the Tank Seam and Hiawatha Seam. Based on my personal experience and professional expertise, it is my opinion that the MER from the LMU would likely decrease by roughly 2 million tons of coal under the room and pillar method.

19. Further, based on my personal experience, professional expertise, and industry custom, the change in mining method of the Tank Seam to room and pillar presents significant risk associated with pressure and loading in the Hiawatha Seam, if a proper Hiawatha Seam mining plan is not completed.

20. Such risks include the compromise or termination of access to the Hiawatha Seam, subsidence in the Hiawatha Seam, roof failure or other collapse in the Hiawatha Seam, and significant, if not catastrophic, human risks.

21. It is my understanding that the Hiawatha Seam presents access to coal reserves of some 35 million tons.

22. With the location of the Hiawatha Seam, room and pillar mining in the Tank Seam would require detailed barrier pillar designs and main entry layout designs in both the Tank Seam and Hiawatha Seam to mitigate overburden pressures, and all related risks, including those to the coal reserves (fee and federal lease) and to mine personnel.

23. Experience in the area of this Mine has shown that in room and pillar circumstances similar to those now forecasted under the BLM Decision, main entries in adjacent

or proximate mines that are placed under barriers will be compromised. It is my belief that the Hiawatha main entries may not last more than approximately two years under the heightened pressures following retreat mining in the Tank Seam.

24. The main entries projected in the Hiawatha Seam under these Tank Seam barrier pillars are designed to provide key access, the only access, to the Hiawatha Seam and northern reserves for a period of over 12 years.

25. In my personal and professional experience, it is my conclusion that such additional barrier pillars required by the room and pillar methodology would have the net effect of decreasing MER from the LMU if not designed correctly, and present unnecessary risks to coal reserves and the personnel mining it. Also, a modification to the Tank Seam layout without consideration and modification to the Hiawatha Seam layout does not represent a correct or realistic design for multiple seam mining.

26. Based on my review of the BLM Decision, there is no consideration of whether the panels are mined on the "way in" or on the "way out," and what the net effects of either approach would be.

27. Based on my review of the BLM's decision-making process, the BLM's Steve Rigby raised these fundamental technical concerns without any subsequent response from Castle Valley Mining or handling by the BLM in the BLM Decision. I attach Mr. Rigby's notes hereto at Tab B.

28. In my opinion, based upon my professional and personal knowledge and my review of the BLM Decision and related materials, the BLM Decision is inadequate because it does not consider the concerns detailed above, nor does it require necessary designs to

accommodate the change in mining methods in light of the multi-seam overlay of the Tank Seam and Hiawatha Seam.

29. I declare under penalty of perjury that the foregoing is true and correct.

EXECUTED this 5th day of April, 2011.

CHARLES REYNOLDS

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TAB A

TAB A

DECLARATION OF CHARLES REYNOLDS

TAB A

Key Research Articles

1. *SME Mining Engineering Handbook*, 2nd Edition, Volume 1, Howard L. Hartman, Senior Editor

2. *Design Practices for Multiple-Seam Room-and-Pillar Mines*, Technology News, From the Bureau of Mines, United States Department of the Interior, No. 443, November 1994

3. *Analysis of Multiple Seam Stability*, Christopher Mark, Principal Research Engineer

4. *Multiple Seam Mining Interactions: Case Histories From the Harris No. 1 Mine*, Frank E. Chase, Phyllip Worley and Christopher Mark

5. *Pillar Design and Strategies for Retreat Mining*, Frank E. Chase and Christopher Mark

6. *Coal Mine Burst Prevention Controls*, Anthony T. Iannacchione, Stephen C. Tadolini

SME Mining Engineering Handbook

2nd Edition
Volume 1

Senior Editor

Howard L. Hartman
Professor Emeritus of Mining Engineering
The University of Alabama

Associate Editors

Scott G. Britton
Vice President
Tanoma Mining Co.

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Head, Dept. of Mining Engineering
Colorado School of Mines

Michael Karmis
Professor and Head, Mining Engineering
Virginia Polytechnic Institute and
State University

Jan M. Mutmansky
Professor, Dept. of Mineral Engineering
The Pennsylvania State University

W. Joseph Schlitt
Manager of Technology
Minerals, Metals, and Chemicals
Brown & Root Braun

Madan M. Singh
President
Engineers International, Inc.

Cosponsored by
Seeley W. Mudd Memorial Fund of AIME

Published by
Society for Mining, Metallurgy, and Exploration, Inc.
Littleton, Colorado · 1992

2nd printing: December 1996

Printed in the United States of America by
Cushing-Malloy, Inc., Ann Arbor, MI

Library of Congress Catalog Card Number 92-61198
ISBN 0-87335-100-2

3. *Panel advanced on entry set: rooms developed and pillars extracted on retreat* (Fig. 18.1.8c). Here a panel entry set (three to five entries) large enough to handle ventilation, haulage, and support services is developed to the full panel length, usually on one side of the panel, although it can be in the center. After establishing a bleeder system, production rooms are developed to the side of the entry set in groups of three or four, then production and chain pillars are extracted using flat or angled pillar lines. Because of the limitation on the number of working faces, this method is only suitable for continuous mining.

4. *Panel developed on entry set; rooms developed and pillars extracted during advance and retreat* (Fig. 18.1.8d). In this method, rooms are developed and pillars extracted on one side of the panel entry set as the panel is advanced. When the entry set reaches the panel limit, and a ventilation bleeder system is established, the rooms on the other side of the entry set are developed, and the resultant pillars are extracted together with the entry set chain pillars in retreat. The pillar line can be flat or angled; the method is only suitable for continuous mining.

Kauffman, Hawkins, and Thompson (1981) consider the advantages and disadvantages of each of these methods related to the more desirable features of room and pillar mining, and these are worth repeating as they highlight the fundamental principle of this type of mining. Desirable features are listed below, and the methods not conforming are mentioned.

1. Active working places should not be near a caved area, since the increased pressures associated with caving increase the likelihood of roof falls. This is a drawback in the case of methods 3 and 4 above.

2. The length of time that openings are maintained should be a minimum. The loosening of roof bolts referred to above and exposure of roof and pillar sides to oxidation and moisture will cause deterioration. The exposure time is largest in the case of methods 1 and 2.

3. Ideally, solid coal should be retained on at least one side of the panel entry to reduce pressures on chain pillars during advance development. This is not the case in method 4.

4. Work places should be concentrated in a limited area. This reduces the area of direct supervision and improves management of the operation. This is not the case in method 2.

5. The tonnage produced between take-ups of belts and services should be maximized, and haul distances should be minimized to reduce nonproductive time. Arguably this is lowest in method 2, highest in 1, 3, and 4.

6. The ventilation system should operate with the minimum number of diversions during mining. The most difficult method to ventilate is method 4.

7. The bleeder system should be easy to establish and maintain in order to reduce ventilation. This is most difficult in the case of method 4.

8. The maximum amount of reserves should be recovered. Ore or coal left in the panel is lost and reduces the overall economics of mining. This is obviously a drawback with method 1.

18.1.4.3 Multiple Layer Room and Pillar Mines

A type of pillar mining that is common but not widely discussed is multiple-layer pillar mining where close vertical separation of pillars may lead to stability problems in roofs and floors. The applied mechanics approach to design is considered by Obert and Duvall (1967), and the main factors can also be identified from Figs. 18.1.5 and 18.1.6.

The main design approach must be to reduce stress concentrations in the roof. It is therefore logical to position pillars above pillars since the lower pillar will provide the better support for the upper pillar. Similarly the rock thickness between the mined layers must be sufficient to avoid excessive stress concentrations. This will depend on local conditions, but it can be seen from Fig. 18.1.5a that in the case of a rectangular excavation a roof thickness of twice the room height would be advisable.

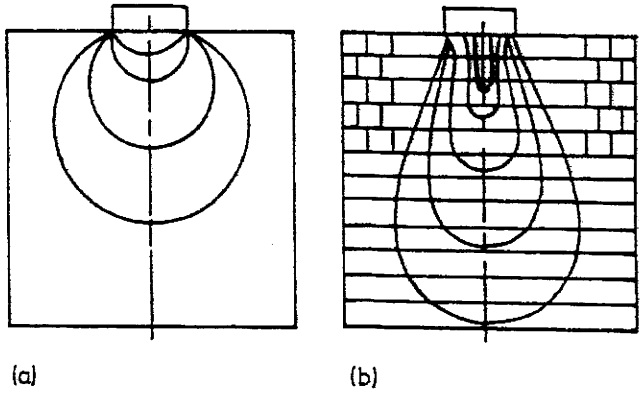

Fig. 18.1.9. Increase in major principal stress beneath a pillar in (a) homogeneous rock and (b) stratified rock. (After Gaziev and Erlikhman, 1971.)

Peng (1986) considers the particular problem in some detail, using the approach devised by Gaziev and Erlikman (1971) who demonstrated, using photoelastic models, the effect that layers of increasing or different modulus could have on the stress distribution beneath a foundation element (Fig. 18.1.9). The unavoidably high stress concentrations under pillars leads to Peng's particular recommendations for multiseam room and pillar mining:

1. *The upper seam is mined out prior to mining the lower seam.* High abutment pressure under upper seam pillars and abutments is the interaction problem most likely to be encountered in the lower seam. The design guidelines applicable to these conditions are (a) no pillars should be left unmined in the upper seam, (b) small pillars should be left in the upper seam if partial extraction is practiced, (c) pillars in the upper and lower seams should be columnized, (d) entries should not be driven under high stress zones such as abutment zones, and (e) longwalling might be the best alternative for the lower seam if pillaring is practiced in the upper seam with a few remnant pillars left.

2. *The lower seam is mined out prior to mining the upper seam.* Subsidence will be the most troublesome interaction effect. Caving induced by the lower seam mining might disrupt mining operations in the upper seam if seam separation is small. The design guidelines applicable to these conditions are (a) do not drive entries in the tensile zone of the subsidence trough, (b) reduce subsidence or arching effects by reducing opening width and extraction ratio, (c) columnize pillars, and (d) backfill the lower seam.

3. *Mining of the upper and lower seams is carried out simultaneously* with development and pillaring being kept in advance in the upper seam. Possible interaction problems are pillar stress concentrations. The design guidelines applicable to these conditions are (a) columnize pillars, and (b) keep the face of the upper seam ahead of the lower seam face by a minimum distance equal to the product of interburden thickness and the angle of draw.

18.1.4.4 Yielding Pillars

A major concept in pillar mining—although it has greater application in chain pillar design for longwall mining—is that

Technology News

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No. 443, November 1994

Design Practices for Multiple-Seam Room-and-Pillar Mines

Objective

Provide room-and-pillar operators with practical information and guidelines concerning multiple-seam mine design to reduce ground problems associated with the interaction of adjacent workings.

Background

Interactions of multiple-seam operations can cause ground problems resulting from the transfer of stress, strata displacement, and caving due to subsidence. Such interactions are a common occurrence, resulting in loss of coal reserves and increased operating costs. Studies estimate that 140 billion metric tons of coal, representing 68 percent of the minable reserves in the United States, are subject to multiple-seam mining. In many instances, mining sequence is based primarily on availability and economics, with little regard for the effects mining would have on coalbeds above and below the one being mined. These practices could have strong implications for resource conservation. For instance, West Virginia, Virginia, and Kentucky have over 90 minable coalbeds, many of which are classified as "low sulfur." Many coal analysts speculate that the 1992 Clean Air Act and new compliance coal standards may shift future mining to these reserves. But without competent design strategies, interactions between vertically adjacent operations will increase the difficulty and expense of mining.

Effective mine planning and design are essential for avoiding ground problems related to multiple-seam mining. To avoid higher mining costs, operators should focus on adopting practices and procedures that prevent and control interactions in multiple seams. The U.S. Bureau of Mines (USBM), in an effort to improve mine planning, is investigating multiple-seam room-and-pillar design and development.

Approach

Factors that influence interactions between operations can be classified as either "geologic" or "mine design" parameters. The geologic parameters include the depth, interburden thickness and physical characteristics, coalbed thickness and physical characteristics, immediate roof-and-floor stratigraphy, and in situ stress fields. The mine design parameters include the seam sequence, pillar size and strength, entry widths and roof spans, percent extraction, mining height, geometric layout of the workings, support methods, and the time delay between mining seams. Optimization of mine design factors is the primary means for controlling interactions between operations.

Of the design factors, three are considered primary and have significant influence in seam interaction. These factors are very closely related and should be weighed equally for effective mine planning. First, the sequence or order in which the seams will be mined will determine the *type* of interaction. Second, the design of pillars and entries will determine the *magnitude* of interaction. Third, the geometric layout of the workings will determine the *location* of interaction. Other parameters fixed by the geologic environment, such as depth and interburden thickness, will influence interaction magnitude and location and must also be considered in the design process.

Empirical investigations involving case study documentation and analysis have constituted most of the USBM research and have provided important information in the development of design procedures. However, computer-based numerical models are gaining more

research attention because they can provide insight into relative stress transfer and distribution in multiple seams. The analysis of different designs using numerical models has considerable potential in helping operators find solutions to complex multiple-seam interactive problems. The USBM's MULSIM/NL model is a boundary element model for calculating stresses and displacements in tabular deposits. The MULSIM/NL model was used to evaluate stress distribution and transfer for design problems that are commonly encountered in multiple-seam room-and-pillar layouts.

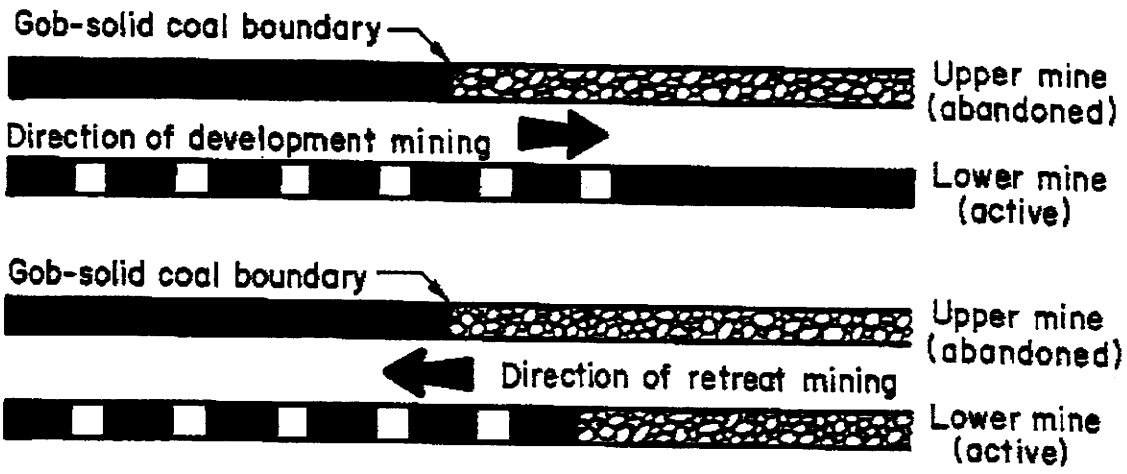
Accomplishments

Some primary findings from these investigations are summarized as follows:

1. To ensure optimum ground conditions, coalbeds should be mined in descending order. This extraction order prevents coalbeds from being damaged by caving and other strata displacements caused by subsidence.
2. Two basic approaches are available for pillar design: yield pillars and conventional pillars. For the most part, further study is required to assess the performance of yield pillars under multiple-seam conditions. However, there are several conventional pillar design approaches available to the operator that have demonstrated their success in the field.
3. There are two basic approaches to laying out room-and pillar panels in successive seams: superpositioned panels or offset panels. Superpositioned panel arrangements will be used, in most instances, for all extraction sequences. Offset arrangements will be used to avoid interactions when geologic conditions are not favorable.
4. High-stress zones are usually encountered in the lower mine when mining occurs beneath an isolated barrier pillar or a gob-solid coal boundary in the upper mine. Stress can be reduced in the lower mine pillars by retreat mining from the gob to the solid side of the boundary and supporting the barrier edge with a row of pillars.

For More Information

USBM Information Circular 9403 and Reports of Investigation 9056, 9066, 9173, and 9176 provide more detail on multiple-seam room-and-pillar design. For a copy of these reports or for additional information concerning the USBM multiple-seam research program, contact Gregory J. Chekan, U.S. Bureau of Mines, Pittsburgh Research Center, P.O. Box 18070, Cochrans Mill Road, Pittsburgh, PA 15236; telephone (412) 892-6749.



Studies show that stress in the lower mine pillars can be reduced when you are mining beneath a gob-solid coal boundary in a overlying mine by following two design criteria: (1) Develop pillars from the solid to the gob side of the boundary, and then retreat pillars from the gob to the solid side, and (2) support the boundary edge with a row of pillars.

Analysis of Multiple Seam Stability

Christopher Mark, Principal Research Engineer
Frank E. Chase, Research Engineer
Deno M. Pappas, Research Engineer
NIOSH-Pittsburgh Research Laboratory
Pittsburgh, PA

ABSTRACT

Multiple seam interactions are a major ground control hazard in many U.S. underground coal mines. The two most common types are:

- Undermining, where stress concentrations caused by previous full extraction in an overlying seam is the primary concern, and;
- Overmining, where previous full extraction in an underlying seam can result in stress concentrations and rock damage from subsidence.

The National Institute for Occupational Safety and Health (NIOSH) has completed a major study aimed at helping to identify the location and likely severity of these interactions. In the course of field visits to mines throughout the U.S., more than 300 multiple seam case histories were assembled into the largest data base of multiple seam case histories ever collected. These data were analyzed with the multivariate statistical technique of logistic regression. The study also employed LaM2D to estimate the multiple seam stresses, ALPS and ARMPS to determine pillar stability factors, and the CMRR to measure roof quality.

The study resulted in the development of a computer program, called Analysis of Multiple Seam Stability (AMSS), which can help mine planners to evaluate each potential interaction and take steps to reduce the risk of ground control failure. AMSS first evaluates pillar design by calculating the single seam Stability Factor (SF_{SS}) using ALPS or ARMPS. It also automatically generates a LaM2D analysis that provides the additional multiple seam stress so that the final, multiple seam SF_{MS} can be determined. The second part of the AMSS procedure builds upon the statistical findings that overmining is much more difficult than undermining, isolated remnant pillars cause more problems than gob-solid boundaries, and weaker roof significantly increases the risk of multiple seam interactions. AMSS quantifies these effects and predicts the outcome in terms of three levels of risk: GREEN (where a major multiple seam interaction is considered unlikely), YELLOW (where adding a pattern of cable bolts or other equivalent supplemental support could greatly reduce the probability of a major interaction.), or RED (a major interaction should be considered likely, and it may be desirable to avoid the area entirely).

ACKNOWLEDGEMENTS

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INTRODUCTION

Studies have estimated that 156 billion tons of coal, representing two-thirds of the mineable reserves in the U.S., are subject to multiple seam mining influences (Singh and Dunn, 1981). In some U.S. coalfields, particularly in Central Appalachia and the West, the majority of today's mines are operating above and/or beneath previously mined seams.

The effects of multiple seam interactions can include roof falls, rib spalling, floor heave, and bumps which can seriously disrupt mining operations and threaten the safety of miners. In early 2006, a West Virginia coal miner was killed by rib roll that occurred in a high-stress zone beneath a remnant structure in an overlying mine (MSHA, 2006).

Fortunately, not every multiple seam situation results in hazardous conditions. Indeed, most do not. Accurate prediction of which interactions are likely to be higher risk allows mine planners to prepare for them or avoid them.

Over the years, multiple seam mining has been the subject of much research, both in the U.S. and internationally. Much advice on how to mitigate the risk has been presented, but unfortunately it is often contradictory. For example, one group of researchers wrote that "stresses from superincumbent workings are not transferred through shale strata for distances of over 110 ft" (Haycocks et al., 1982), while another group indicated that "a stress transfer distance of 760 ft has been recorded between longwalls" (Haycocks et al., 1992).

For the past several years NIOSH has been conducting research with the goal of developing better techniques to predict the location and severity of multiple seam interactions. In the course of this investigation, more than 40 mines were visited across the U.S.

coalfields. The study also made extensive use of numerical models, particularly the LaModel family of software (Heasley and Akinkugbe, 2004).

MULTIPLE SEAM MINING IN THE U.S.

Figure 1 shows the 5 major regions for underground coal mining in the U.S. From the standpoint of multiple seam mining, by far the most significant is the Central Appalachian region of southern WV, eastern KY, and southwestern VA. Currently, underground mines in this region produce approximately 123 million tons of coal per year, or about 33% of the total U.S. underground production (DOE-EIA, 2006). Mining has been ongoing in Central Appalachia for nearly 150 years, and recent studies have indicated that perhaps 70% of the ultimate reserve base in the region has already been mined out (Bate and Kvitovich, 2004).

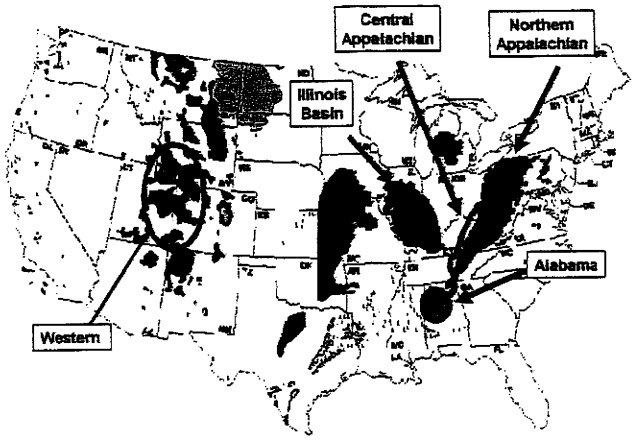

Figure 1. The five major underground coal mining regions in the United States.

One consequence of the maturity of the central Appalachian coal fields is that nearly every remaining underground reserve has been impacted by past mining activity. The mountains of the central Appalachian coalfields are honeycombed with worked-out mines, located above, below, and adjacent to today's and tomorrow's operations. Full-extraction is also widely practiced in the Central Appalachian coalfields. While only 8 mines currently employ the longwall method (Fiscor, 2007), a recent survey indicated that approximately 315 mines, accounting for 58% of the room and pillar production in the region, engage in pillar recovery (Mark et al., 2003). The prevalence of full extraction adds greatly to the potential for multiple seam interactions.

The Western U.S. is the next most significant area for multiple seam mining. Here, in the states of UT, CO, WY, and NM, nearly 95% of underground production comes from 13 longwall operations (DOE-EIA, 2006; Fiscor, 2007). Approximately half of these are operating in multiple seam configurations. In contrast to Central Appalachia, in the West the same mining company is usually responsible for all the mining on a property. As a result, a greater degree of multiple seam planning is normally possible. On the other hand, when combined with deep cover and strong roof and floor rock, multiple seam interactions can contribute to deadly bump hazards (Peperakis, 1968; Iannacchione and Zelanko, 1995).

In none of the other three underground mining regions are multiple seam interactions currently a major factor, though all three have historically had problems (Kohli, 1992; Paul and Geyer, 1932; Zachar, 1952), and they may very well have them again in the future. Factors that contribute to the relative lack of multiple seam interactions in these regions include:

- Most longwall production in the Northern Appalachian and Alabama coalfields is from a single seam (the Pittsburgh and the Blue Creek seams respectively), without significant mining in other seams above or below;
- The depth of cover, particularly for room and pillar mines, is relatively low in Northern Appalachia and the Illinois Basin, and;
- Very few room and pillar mines engage in full-extraction pillar recovery in the Illinois Basin, and there is almost no room and pillar mining at all in Alabama.

HAZARDS ASSOCIATED WITH MULTIPLE SEAM MINING

Ground instability is usually the greatest hazard due to multiple seam interaction. Interactions may be classed into four major categories, depending on the mining method, the mining sequence, and the thickness of the interburden. Other potential hazards are associated with inflows of water, gas, or oxygen-deficient air.

Undermining, the first category of interaction, occurs when the upper seam has been mined first and the lower seam is the active seam (figure 2). In an undermining situation, damage is caused by load transfer from highly stressed remnant structures associated with full-extraction mining in the overlying seam. For significant load transfer to occur, the interburden must be relatively thin, and the seams must be relatively deep.

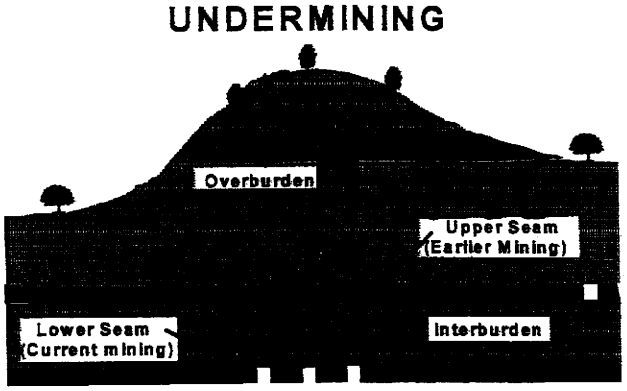

Figure 2. Undermining

Two types of remnant structures can cause undermining interactions (figure 3). A gob-solid boundary carries a single, distributed abutment load, while an isolated remnant pillar is subjected to two, overlapping abutments. As a result, the stress concentration on an isolated remnant pillar is usually significantly larger than that on a gob-solid boundary, and its impact on underlying seams proportionally greater.

Stemple (1956) conducted a landmark study of multiple seam interactions which involved the collection of 61 case histories from the eastern U.S. He found that in all the cases where undermining interactions occurred, the depth of cover exceeded 500 ft, and the interburden was less than 110 ft. Prof. Chris Haycocks and his

- Orientation relative to other seam remnant structures is not a major factor for development workings.

Hsuing and Peng (1987a) used finite element modeling to develop some rules-of-thumb for undermining. They concluded that if the interburden thickness is 2-3 times the width of the upper seam isolated remnant pillar, no interaction is likely to occur. On the other hand, when the interburden is less than 10 times the mining height of the upper seam, the models indicated that the lower seam is likely to be fractured as well as highly stressed. Hsuing and Peng (1987b) also indicated that it is best to retreat from the gob towards the solid, and that the best situation occurs when a longwall face maintains an approach angle of about 30 degrees to remnant structure.

Some recent examples of finite element and finite difference model applications to multiple seam mining include 2- and 3-D analyses of pillar and roof stability in overmining cases from northern WV (Zhang et al., 2004; Morsy et al., 2006). Zipf (2005) focused on the effects of vertical stress, horizontal stress, stress reorientation, and bedding slip on failure mechanics during multiple seam mining. Gale (2004) evaluated different stacked longwall chain pillar layouts in the Australian context, and concluded (as have many others) that the offset arrangement is far superior to vertical stacking. His models also predicted that stress transfer might be observed up to 4 pillar widths above and below a chain pillar, which would be approximately 400 ft for a typical Australian longwall design.

FACTORS AFFECTING MULTIPLE SEAM INTERACTIONS

Nearly a century of research has identified a number of qualitative factors that can affect the intensity of a multiple seam interaction. These include:

- *Depth of cover*: The deeper the overburden, the greater the potential stress concentration caused by multiple seam mining.
- *Mining sequence*: Overmining is more difficult than undermining, because of the potential for rock damage caused by subsidence. Dynamic interactions (particularly retreating beneath open works) should be avoided at all costs.
- *Interburden thickness*: The smaller the distance between the seams, the greater the intensity of the potential interaction.
- *Type of remnant structure*: Isolated remnant pillars that are surrounded by gob cause more intense interactions than do gob-solid boundaries. First workings are generally not a concern unless the seams are ultra-close.
- *Interburden geology*: Stronger, less bedded interburden tend to distribute multiple seam stress concentrations more rapidly, resulting in less intense interactions.
- *Immediate roof geology*: Weak roof (and floor) are more likely to be damaged by multiple seam interactions.
- *Angle of approach to remnant structure*: Retreat mining should proceed from the gob towards the solid side of a gob-solid boundary, and a longwall should not be brought broadside into long remnant structure.

The goal of the NIOSH multiple seam study was to *quantify* the effects of these factors, so that they can be evaluated on a site-specific basis and used in design.

NIOSH MULTIPLE SEAM DATA BASE

In conducting the study, NIOSH relied primarily on an empirical approach. Empirical methods in ground control start with the concept that real-world mining experience, in the form of case histories, can provide valuable insight into the performance of very complex rock mechanics systems. In recent years, statistical analysis of large ground control case history data bases has led to the development of methods for longwall pillar design (Mark et al., 1994; Colwell et al., 1999), roof bolt selection (Mark et al., 2001), retreat mine pillar design (Mark and Chase, 1997), and the design of rib support (Colwell and Mark, 2005). While fairly uncommon in mining, modern empirical research methods based on quantitative data analysis using statistics are the foundation of econometrics, epidemiology and many other scientific disciplines.

Past empirical studies of multiple seam mining have floundered because the data bases were too small for the large number of geologic and mining variables involved in multiple seam interactions, and because bi-variate analyses are inappropriate when there are so many variables involved. The key to the success of the NIOSH study was the assembly of the largest data base of multiple seam case histories ever collected.

The mines included in the NIOSH data base were identified through discussions with mining company personnel and MSHA Roof Control Specialists in each District. The study focused on those mines that had experienced the most difficulties with multiple seam interactions. A total of 44 mines were visited in the course of the study, nearly all from the Central Appalachian and Western coalfields (figure 8).

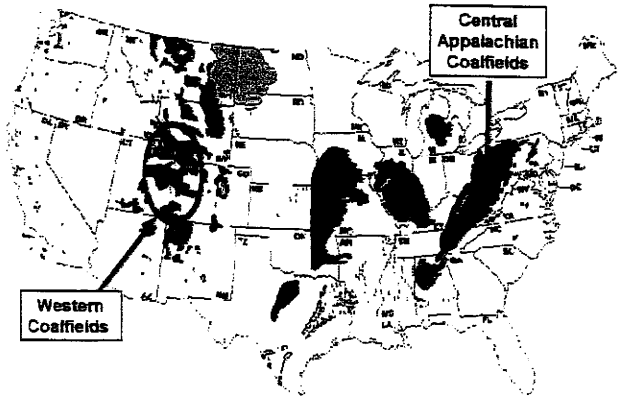

Figure 8. Location of mines included in the NIOSH multiple-seam data base.

The key goal of each mine visit was to develop a history of multiple seam interactions for the operation. Care was also taken to collect successful case histories as well as unsuccessful ones. Overlay mine maps, showing both the active mine and past workings above and/or below, were reviewed with experienced mine officials who had first-hand experience of the conditions encountered. Every instance where the active mine had crossed a gob-solid boundary or a remnant pillar was discussed. The officials also provided their best recollection of the support used and other relevant information. These discussions resulted in a preliminary

- In order to compensate for an additional 1,000 psi of vertical stress on the critical pillar, an additional 35 ft of interburden would be required;
- Overmining requires 77 more ft of interburden (or a 2,200 psi reduction in the total vertical stress) than undermining;
- An isolated remnant pillar requires 77 more ft of interburden (or a 2,200 psi reduction in the total vertical stress) than a gob solid boundary;
- A CMRR = 45 roof requires approximately 50 more ft of interburden (or 1,580 psi less total vertical stress) than a CMRR = 65 roof.

The analysis indicates that by installing a pattern of cable bolts or other heavy supplemental support it may be possible to mine with 87 ft less of interburden than would be the case without the extra support. However, while supplemental support may make mining possible, the likelihood of encountering rib spalling, floor heave, or hazardous roof also increases when the analysis suggests that supplemental support is necessary.

In Figure 17, the case histories are plotted again, but this time each point is plotted with its suggested overburden for the no extra support (EX=0) condition. Three regions are defined on the graph. The uppermost region, where the actual interburden exceeds the critical interburden when EX=0 is labeled "Predicted Successes." Within this "Green" region, 97% of the case histories that maintained an adequate pillar SF were successful. In the middle, "Yellow" region, success is predicted only if a pattern of supplemental support is installed. Within the Yellow zone, 93% of the cases that did install supplemental support were successful, while just 63% of those who did not succeeded. In the bottom, or "Red" region of the graph, where failure is predicted, only 52% of the cases were successful.

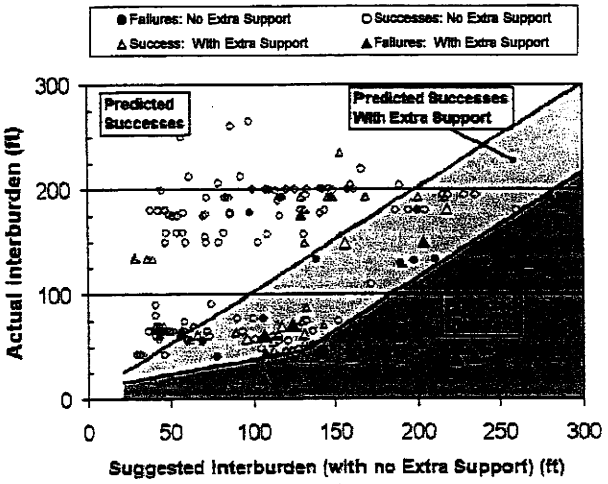

Figure 17. Suggested critical interburden values setting EX=0.

VARIABLES NOT INCLUDED IN THE DESIGN EQUATION

The design equation does not include a number of variables that past studies had identified as being important to multiple seam analysis. This does not mean that these variables are not important, only that their influence was not identified in this study. For example, interburden competence was not significant in the NIOSH study. Two related factors may have contributed to this:

- The percent of competent rock was based entirely on the geologic descriptions included with the core logs. In many cases, the description was little more than the rock type (shale, sandstone, etc.). In the Central Appalachian coalfields, however, some siltstones and even shales can be very strong (Rusnak and Mark, 2000). Without an actual geotechnical description, some weak rocks may have been labeled strong, and vice versa.

- Since the case histories are all from two coalfields where the rocks tend to be strong, there may not be sufficient variability in the data base to capture the effect of interburden competence.

The time lag since mining the bottom seam was another variable that was not statistically significant. The data base contained a total of 12 overmining cases in which the time lag was less than 10 years. Of these, all but two were successes, indicating that time lag by itself is unlikely to be a major factor. However, one of the two failures proved to be a major outlier when compared with the rest of the data base. It seems quite likely, in this instance at least, that the settling time was important.

The lack of influence of the lower coal bed to interburden thickness ratio may also be due to the small number of relevant cases in the data base. There were 30 cases (21 development and 9 retreat) in which the interburden thickness was 7.5-10 times the lower coal bed thickness. Of these, 13, or 44%, are failures, which is a relatively high failure rate. However, the effect may be captured by other variables, particularly the interburden thickness, which was less than 50 ft in all but one of these cases. It seems likely that the upper seam mining in these 30 cases probably took place in the fracture zone, above the top of the caving zone which is normally 6-10 seam heights above the lower bed (see figure 11). It may be that once the upper seam is above the caving zone, the lower coal bed to interburden thickness ratio may not be significant. However, since all of these cases (but one) came from just two mines in Virginia, it is possible that more trouble might be encountered in other geologic environments.

Retreat mining was another factor that was not significant in the final analysis. The effect of retreat mining is indirectly included in the total vertical stress variable, however. On average, the total vertical stress was 20% greater in the retreat cases than in the development cases.

ANALYSIS OF MULTIPLE SEAM STABILITY (AMSS)

The results of this study have been implemented in a software package called "Analysis of Multiple Seam Stability" (AMSS). AMSS requires only that the user input a variety of easily-obtained geometric and mining parameters. The program automatically runs the necessary LaM2D and ALPS or ARMPS analyses. The primary output from AMSS is a three-level (green/yellow/red) prediction of the intensity of the multiple seam interaction that is likely to be encountered. The step-by-step procedure for using AMSS follows:

1. Identify critical remnant structures on the maps of mining in seams above and below the target seam. Every

remnant structure that may be crossed by active mine workings should be evaluated.

2. For each potential remnant structure crossing, determine these AMSS input parameters using the maps and core logs:

   - Depth of cover to the target seam;
   - Interburden thickness;
   - Seam heights (both seams);
   - Age of the older workings;
   - CMRR for the roof of the target seam.

3. Check that the parameters of the case being considered fall within the limits of the AMSS data base. If the roof of the active seam is very weak (CMRR<45) or the stress is very high (>5,000 psi) then AMSS should be used with caution. The same is true if the case involves overmining and the lower coalbed thickness to interburden ratio is less than 10. If the interburden thickness is less than 30 ft in either undermining or overmining, then potential for an ultra-close interaction should be the primary consideration. AMSS will help with this by printing a "warning" if the data entered falls at the margins of the data base.

4. Determine whether the remnant structure is a gob-solid boundary or an isolated remnant pillar. Figure 9 may be used if the structure is a pillar. If the remnant pillar is so small that it may have failed completely, it may be helpful to determine its ARMPS SF.

5. Enter the AMSS parameters on the first input page of the program. These parameters include:

   - Whether the active mining is longwall or room and pillar;
   - Whether the case is undermining or overmining;
   - The interburden thickness;
   - The type of remnant structure;
   - The active seam CMRR;
   - The previously mined seam thickness;
   - The width of gob areas, and;
   - The width of the isolated remnant pillar (if present).

6. Enter the mining parameters for the active seam into the ARMPS or ALPS module for the proposed section in the target seam. AMSS then automatically conducts a single seam ALPS or ARMPS analysis, as appropriate.

7. AMSS automatically creates a LaM2D grid, and conducts a LaM2D analysis of the remnant structure crossing. It then determines the multiple seam stress applied to the critical pillar in the target seam.

8. AMSS determines the ARMPS or ALPS multiple seam pillar stability factor (SF_{MS}) for the target seam using equation (5), and compares it to the recommended ARMPS or ALPS SF. If the calculated SF_{MS} is lower than the recommended value, then AMSS will print a "warning" suggesting that the pillar size should be increased.

9. AMSS will use the design equations (equations 8 and 9) to determine the critical interburden thickness (INTcrit) and the maximum allowable total vertical stress on the critical pillar (TVSallow), both with and without supplemental support.

10. AMSS compares the actual interburden and stress with the INTcrit and TVSallow values determined in step 9. Three predicted outcomes are possible:

    a. GREEN: If INTcrit is significantly less than the actual interburden without supplemental support, then a major multiple seam interaction can be considered unlikely.

    b. YELLOW: If the actual interburden is less than INTcrit without supplemental support, but greater than INTcrit with supplemental support, then adding a pattern of cable bolts or other equivalent supplemental support could greatly reduce the probability of a major interaction.

    c. RED: If INTcrit even with supplemental support is greater than the actual interburden thickness, then a major interaction should be considered likely, and it may be desirable to avoid the area entirely.

If desired, the pillar design in the target seam can be adjusted before running the program again. Changing the pillar size changes the value of the TVS, which can reduce it below the TVSallow (reducing the TVS also reduces the INTcrit.). Finally, if the case still falls within the "Yellow" range, it might be desirable to conduct a more detailed analysis using LaModel 3D.

CONCLUSIONS

To conduct this study, NIOSH collected the largest data base of multiple seam case histories ever assembled. These data were analyzed with the multivariate statistical technique of logistic regression. The study also employed LaM2D to estimate the multiple seam stress, ALPS and ARMPS to determine pillar stability factors, and the CMRR to measure roof quality.

Several of the study's findings confirm the conventional wisdom about multiple seam interactions. Overmining was found to be much more difficult than undermining, and isolated remnant pillars caused more problems than gob-solid boundaries. For the first time, however, it was possible to quantify these effects for protective mine design.

The study found that pillar design is a critical component of multiple seam mine planning. Many of the failed cases involved pillars whose SF appeared inadequate once the multiple seam stresses were accounted for. Weaker roof was also found to significantly increase the risk of multiple seam interactions. Some factors that were not found to be statistically significant included the interburden competence, the time lag between mining the two seams, the lower coal bed to interburden thickness ratio, and the angle between the active mining and the remnant structure.

The study resulted in the development of a computer program, called Analysis of Multiple Seam Stability (AMSS), which can help mine planners to evaluate each potential interaction and take steps to reduce the risk of ground control failure. The first step in the AMSS procedure is to evaluate the pillar design. The AMSS program calculates the single seam SF_{SS} using ALPS or ARMPS, and then it automatically generates a Lam2D analysis that provides

Multiple Seam Mining Interactions: Case Histories From the Harris No. 1 Mine

Frank E. Chase, Research Geologist
NIOSH-Pittsburgh Research Laboratory
Pittsburgh, PA

Phyllip Worley, Senior Manager of Engineering
Peabody Energy
Wharton, WV

Christopher Mark, Supervisory Mining Engineer
NIOSH-Pittsburgh Research Laboratory
Pittsburgh, PA

ABSTRACT

The Harris No. 1 Mine, located in Boone County, WV, has been longwalling the Eagle Coalbed for over 30 years. Harris has experienced numerous interactions associated with the extensive room-and-pillar and longwall mining operations which have been conducted in the overlying No. 2 Gas Coalbed. The problems have included roof falls, excessive rib sloughage, and gateroad and bleeder entry closure. A detailed evaluation of the multiple seam experiences at Harris No. 1 Mine was conducted as part of the National Institute for Occupational Safety and Health (NIOSH) nation-wide multiple seam mining case history data base. One observation from the Harris gateroad case histories was that smaller, critically loaded, upper seam pillars seemed to cause more severe ground conditions than did wider pillars. The LaModel program was used to investigate this supposition, and the results confirmed that "critical" sized pillars do transmit the highest amounts of stress to adjacent seams. In addition, the data suggest that the probability of a major multiple seam mining interaction increases when the depth of cover is 1,000 ft or greater and when the Eagle seam pillars have a Analysis of Longwall Pillar stability factor less than 1.50.

INTRODUCTION

The National Institute for Occupational Safety and Health has recently completed a comprehensive nation-wide data base of multiple seam mining case histories. To collect the case histories, underground geotechnical evaluations were conducted at more than 45 U.S. coal mines. The data is currently being analyzed in order to ascertain the relative importance of the various contributory mining and geologic parameters responsible for multiple seam mining interactions. The ultimate goal is to provide the mining community with a design methodology for multiple seam mining which will aid in determining the likelihood of adverse interactions so that corrective measures can be taken to prevent injuries and fatalities.

During the study, 22 multiple seam case histories were collected from the Harris No. 1 Mine, more than at any other mine site. An area was deemed to be a case history if a multiple seam interaction occurred or should have been anticipated. This accumulation of such a significant number of cases over a relatively small geographic area presented an excellent opportunity to conduct a study which would evaluate the current state-of-the-art in multiple seam design. In other words, can the criteria that engineers employ to predict whether or not a multiple seam interaction will occur be used to explain Harris' experiences?

The Harris No. 1 Mine is operated by Eastern Associated Coal Corporation which is a subsidiary of Peabody Energy. Harris is located in Wharton, WV, and began operations in 1966 (figure 1). Since then, Harris has driven and retreat mined over 60 longwall panels in the Eagle Coalbed. The No. 2 Gas Coalbed is situated approximately 200 ft above the Harris Mine workings. Both longwall and room-and-pillar retreat mining have been conducted in the No. 2 Gas. In many cases, remnant structures such as barrier pillars, isolated gateroads (gateroads which are bordered by gob on both sides), etc. that were left in the 2 Gas have caused difficult ground conditions in Harris due to downward load transfer. In other instances, upper seam structures have not noticeably impacted mining. From the mine planning perspective, the paramount question is: When will multiple seam problems occur and how severe will the interaction be? The purpose of this investigation was to shed some light on these questions by conducting detailed analyses of Harris' experiences.

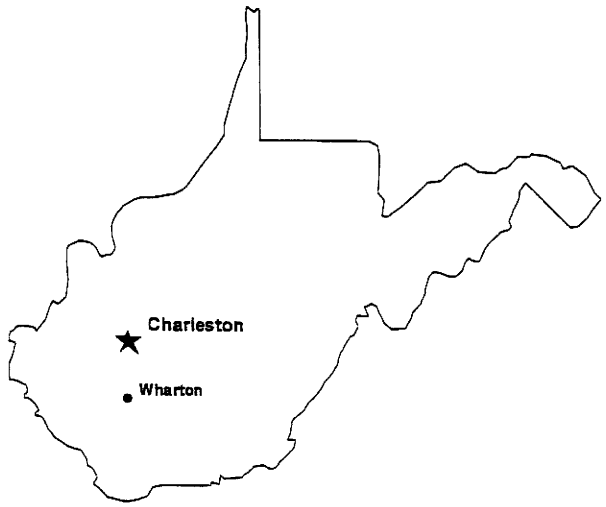

Figure 1. Harris No. 1 Mine location map.

GEOLOGIC SETTING

The topography above Harris No. 1 Mine is fairly rugged. The valleys are narrow and "V" shaped and ridges are steep and prominent. These physiographical features can cause rapid changes in cover over relatively short horizontal distances. The overburden at Harris ranges from 100 ft at the drift to slightly over 1,400 ft under the highest ridges. As is the case with most Central Appalachian coal mines, the overburden is relatively competent.

Previous researchers (1-3) have determined correlations between multiple seam interactions and the interburden competency, thickness, and number of interbeds (number of distinct rock units within the interburden); therefore, considerable emphasis was placed on obtaining core hole information as close to the case history sites as possible. The information on interburden characteristics is listed in the Appendix. As indicated in the Appendix, the interburden between the Eagle and No. 2 Gas ranges in thickness from 176 to 213 ft.

Figure 2 is a generalized stratigraphic column of the interburden between the No. 2 Gas and Eagle Coalbeds. It should also be noted that the major sandstone and shale units shown in figure 2 vary in thickness. For example, in a few of the core holes the upper two sandstone units merge into a 100 ft thick unit. The same can be said for the lower two sandstone units. These rock unit thickness variations suggest ancient stream channel activity. Usually, the interburden contains 6 distinct rock units; however, the actual number varies from 4 to 7. In general, the interburden is rather competent, with the percentage of sandstone, sandy shale, and limestone ranging from 59 to 80 percent. The coalbeds between the Eagle and No. 2 Gas shown in figure 2 have not been mined above Harris.

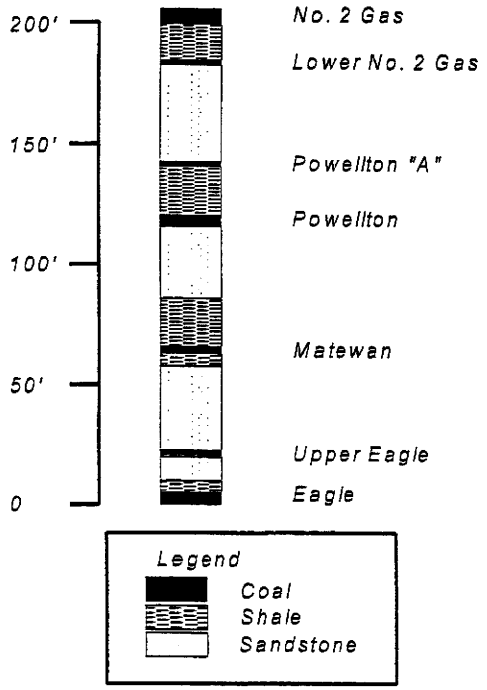

Figure 2. Generalized interburden stratigraphy.

Another factor identified in determining the magnitude of the interaction is the immediate roof rock competency (4). The shale unit shown in figure 2 directly above the Eagle Coalbed varies in thickness from 0 to 10 ft. In areas of Harris, this shale unit can either be laminated, sandy, or nonexistent (replaced by a sandstone scour). These fluctuations explain the range in Coal Mine Roof Rating (5) values from 44 to 71. These values indicate that the immediate roof rock is moderately strong to strong.

GATEROAD DESIGN AND SUPPORT

Harris began longwall operations with a 300 ft wide plow face and 40 ton walking frames in 1966. Since then, numerous technological innovations have lead to improvements in the longwall systems and gateroad supplemental supports employed. Currently, Harris is mining 3.2 million clean tons of coal per year. Gateroad pillar design and supplemental support selection have also gone through an evolutionary process at Harris based on the performance of past longwall faces and gateroads. In fact, twelve different gateroad designs which incorporated various elements of a 3-entry, 4-entry, and yield pillar designs have been tried at Harris. The gateroad system design was progressively refined and calibrated through the back analyses of previous successful and not so successful mining attempts.

The engineers at Harris utilize the novel approach of integrating the multiple seam stress transfer values obtained from the LaModel program (6) into the Analysis of Longwall Pillar Stability program (7) in order to obtain a more realistic stability factor (SF). This methodology is described in the Discussion section of this paper. For the past 5 years, Harris has been using a 3 entry gateroad system with entries on 90 ft centers and crosscuts on 140 ft centers. This system has worked well and no gateroad blockages have occurred since its usage began. Based on past experiences, during mine design Harris' engineers adhere to the following "rules-of-thumb" as much as possible: 1) the long axis of the panel to be mined should be parallel to that of the upper seam panel, 2) the future headgate should be positioned under, and as close to the center of the gob as possible, and 3) avoid advancing the longwall face under a gob/solid boundary (8).

Harris uses 5 ft full column resin bolts on 4 ft centers in the headgate entry. In the remaining gates and bleeders 4 ft full column resin bolts on 4 ft centers are standard. The roof control plan also stipulates that a minimum of 2 crib equivalents be installed every 12 ft in the tailgate. Floor heave has always been a major concern at Harris. Because conventional cribs (both 4 and 9 point) are inclined to roll out when subjected to heave, Harris began using 30 inch engineered timber supports. These supports have performed well, in that the floor tends to heave up around the supports.

The engineers at Harris also use the LaModel program to identify high vertical stress areas which are caused by deep cover, abutment loads, and/or multiple seam stress transfer. In highly stressed areas, either 2 or 4, 12 ft long cable bolts are installed in between each row of primary supports. Sometimes, additional engineered timber supports are warranted in tailgate locations. The spacing of these supports is dependent upon the expected level of stress.

CASE HISTORY ANALYSES

A detailed examination of both the No. 2 Gas and Harris No. 1 workings (figure 3) revealed 22 case histories where multiple seam interactions happened or might have been anticipated. In each case history, gateroads were driven and panels were extracted under various upper seam structures, and the outcomes are listed in the Appendix. Overburden depth, interburden thickness and composition, and additional consequential mining parameters, which are thought to determine whether or not interactions will occur (1-3) are also listed in the Appendix. Prior to the analyses, the data base was separated into two categories, gate entry workings (17 cases) or longwall face stability (5 cases) because of the major differences between the two. A rating system from 1 to 6 (see the Appendix for details) was developed to numerically evaluate the conditions or degree of interaction for each case. For the purpose of analyses, conditions 1 and 2 were combined and categorized as being a minor interaction because the interactions were barely negligible to minor. Conditions 3 through 6 were combined and designated as being a major interaction because the interactions were troublesome to major and warranted that special measures to be taken.

A series of XY scatter plots were generated in order to examine the various mining and geologic parameters for correlations. Figure 4 indicates that 6 out of 7 of the major interaction gateroad workings cases occurred when Harris' depth of cover was 1,000 ft or greater and the Analysis of Longwall Pillar Stability Factor (ALPS) was 1.5 or less. Further, figure 5 points out that 5 out of 7 of the major interaction cases occurred when the No. 2 Gas ALPS

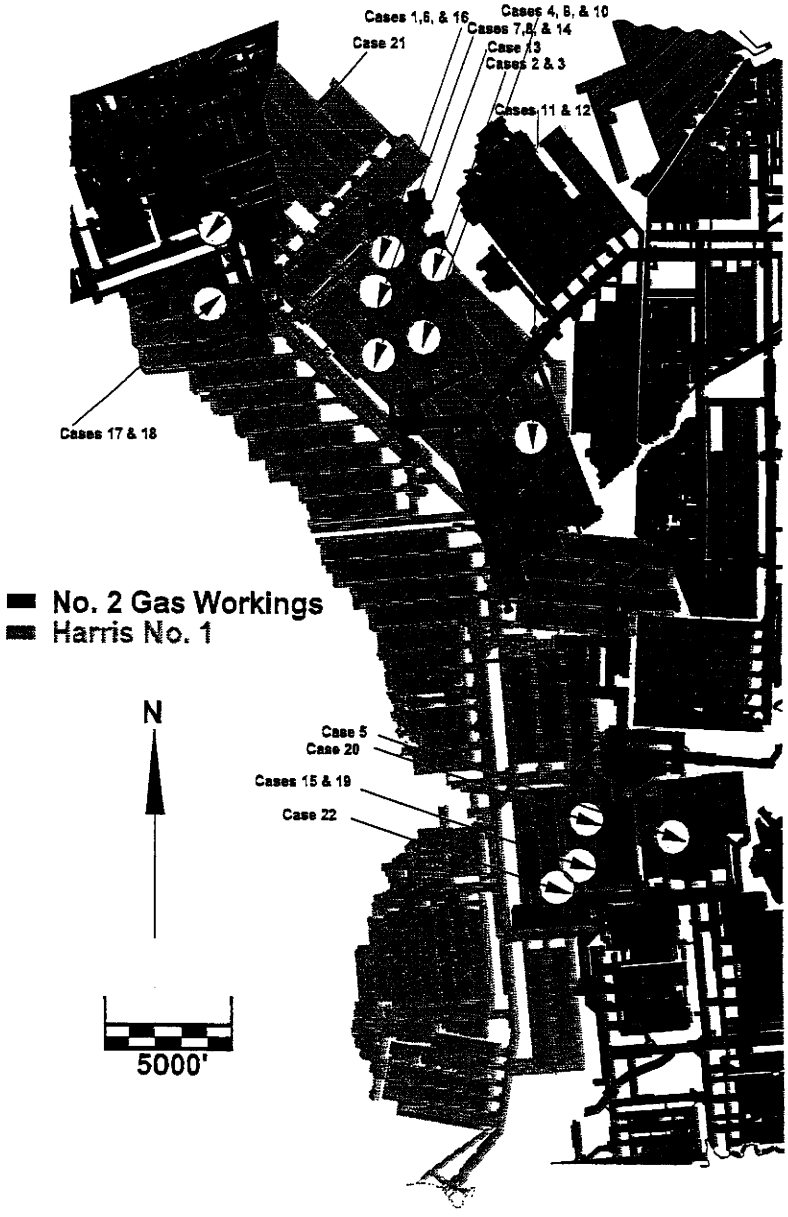

Figure 3. No. 2 Gas workings superimposed on Harris No. 1 Mine.

SF was less than 1.0 and the depth of cover was 1,000 ft or more in Harris. Finally, figure 6 illustrates a weak correlation between problematic cases and a No. 2 Gas overburden/interburden ratio of 3.9 or greater. As for the five longwall face stability cases, the only parallels that could be drawn were that the depth of cover was primarily 1,000 ft or greater, and the immediate roof rock was enerally relatively weak. Upper seam pillar design did not appear to be an issue; however, both it and the findings mentioned in this section warrant additional examination and discussion.

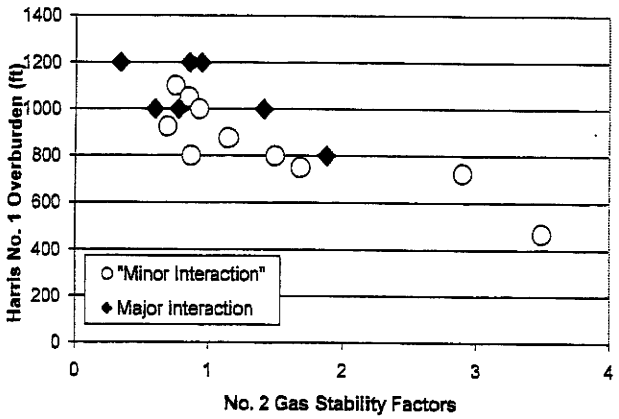

Figure 5. Relationship between degree of interaction and the No. 2 Gas ALPS stability factors and Harris No. 1 overburden.

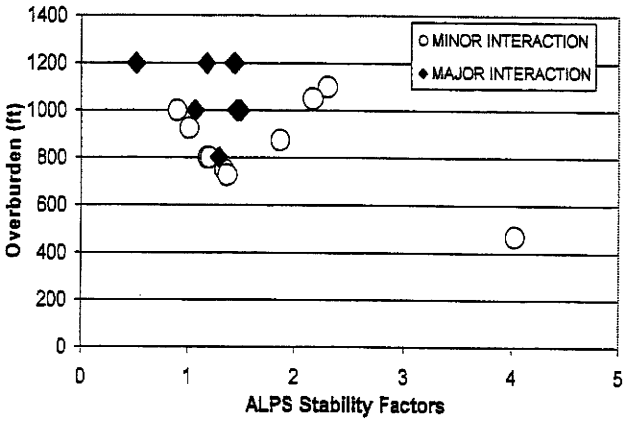

Figure 4. Relationship between degree of interaction and the Harris No. 1 ALPS stability factors and overburden.

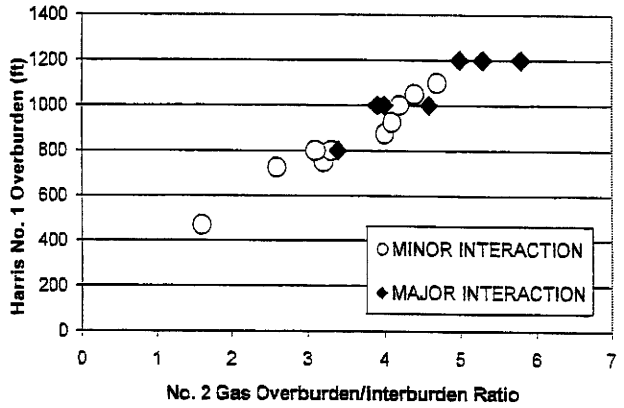

Figure 6. Relationship between degree of interaction and the No. 2 Gas overburden/interburden ratio and Harris No. 1 overburden.

UPPER SEAM PILLAR DESIGN

As indicated in the previous section, most of the multiple seam interaction problems in Harris' gate entries occurred when the upper seam ALPS SF's were less than 1.00. At first, it might seem counter-intuitive that smaller upper seam pillars would cause more severe stress conditions in an underlying seam than would wider pillars. However, a consideration of the load distribution in the upper seam pillars provides an explanation. Essentially, three load distributions are possible, as shown in figure 7:

- A) illustrates a small, yielded pillar that carries a relatively small load;
- B) illustrates a wide pillar, with localized high stress zones near the ribs but a lightly loaded core, and,
- C) illustrates the load distribution of a "*critical pillar*," with a highly loaded core.

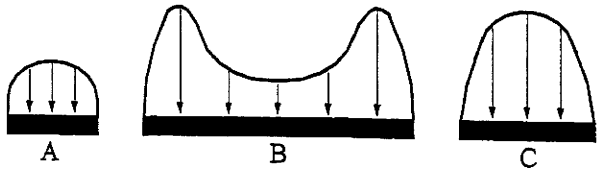

Figure 7. Pillar loads distribution diagrams: (A) yielded (B) wide (C) critical

The critical pillar would result in the most severe "footprint" on the lower seam, because it produces an intensified downward "point load" type of stress transfer to the underlying workings. The wide pillar may carry a larger total load, but because that load is distributed over a much larger area, its effect on the lower seam is less noticeable. A good analogy would be the imprints that a petite woman in high heels might make in wet sand compared with those made by a sizeable football player wearing tennis shoes.

LaModel, a displacement-discontinuity boundary element program was used to evaluate the hypothesis described above. The models were run using standard default parameters and yield zones. Figure 8 displays the basic layout of the two mine designs which were modeled. In the Harris design case, a three entry longwall gate entry development section (oriented from top to bottom on figure 8) was driven on 120 ft entry and crosscut centers in a 6 ft high reserve. The pillars had an ALPS SF of 3.07 and the depth of cover was 1,200 ft. A three entry isolated gateroad system (oriented from left to right on figure 8) was then situated 200 ft above Harris. The crosscut center spacing in the No. 2 Gas remained constant at 140 ft. The entry centers were varied from 30 to 180 ft in 10 ft increments for each LaModel run and the mining height was 6 ft. As illustrated in figure 8, the No. 2 Gas and Harris workings are situated perpendicular to one another so that four pillars were stacked in the center of the LaModel grid. Figure 8 also displays the LaModel analysis results for a No. 2 Gas gateroad system with 60 ft wide pillars. Figure 8 clearly shows that the multiple seam stress transfer magnitudes in Harris are the highest beneath the isolated gateroads. Conversely, the de-stressing effects of the overlying gob are also evident in figure 8.

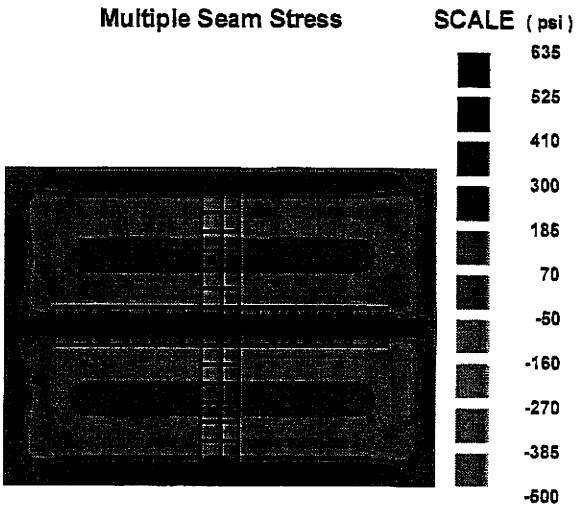

Figure 8. LaModel output for 60 ft wide No. 2 Gas pillars.

Figure 9 displays the peak multiple seam stress transfer value and the ALPS SF for each pillar width modeled. Figure 9 illustrates the wide range in multiple seam peak stress transfer values which are dependent on the width of the pillar. When analyzing figure 9, the multiple seam stress transfer curve appears to have three distinct regions that correspond to the three upper seam load distributions shown in figure 7. The peak or "critical" multiple seam stress transfer values occur when the chain pillars in the upper seam are in the 50 to 90 ft range. The models indicated that the cores of these pillars were all heavily loaded. On the left side of the critical pillar region, the models showed that the stresses in the cores of smaller, upper seam pillars were much lower than for the critical pillars. The smaller the pillar, the lower the peak stress, and the less the multiple seam stress experienced in the lower seam. On the right side of the critical pillar region, as the upper seam pillars get wider, they distribute their load more evenly. The result is a steady decreasing trend in downward stress transfer as the pillar width is increased up to around 130 ft. Once the pillar reaches a certain width, there is essentially no interaction between the two high-stress zones at the ribs and the peak stress transfer levels out at approximately 350 psi.

DISCUSSION

For want of a better adjective, the term "critical" was used to describe the pillars whose size transferred the highest multiple seam stress values. Obviously the word critical conjures up different meanings depending on whether you are designing deep cover gateroad yield pillars or mining in bump prone ground conditions. However, from a multiple seam aspect, the LaModel analyses indicate that critically-sized upper seam pillars can increase the lower seam pillar stresses substantially. In this study, the LaModel results were used to calculate the average stress increase in a Harris tailgate pillar system caused by isolated No. 2 Gas gateroads on 80 ft wide entry centers. The calculated average multiple seam pillar stress was 396 psi, which is approximately equivalent to increasing the depth of cover by 360 ft. Therefore, a Harris tailgate system which was initially designed for 1,200 ft of overburden and having a conservative ALPS SF of 1.23 was, in actuality, being subjected to cover loads equivalent to 1,560 ft of overburden which effectively reduces the ALPS SF to 0.88. This example emphasizes the importance of both estimating and incorporating multiple seam stress transfer into the pillar design process. It implies that wider pillars with higher ALPS SF's should be employed; however, gateroad developmental constraints also need to be considered. The engineers at Harris are currently using this methodology to design gateroad pillar systems and, based on past experiences, an ALPS SF in the 1.0 to 1.2 range (taking into account the additional multiple seam stress) has been determined to provide satisfactory results. It should be noted that the stress transfer values and critical pillar dimension widths previously mentioned are case specific and will vary depending upon the input parameters.

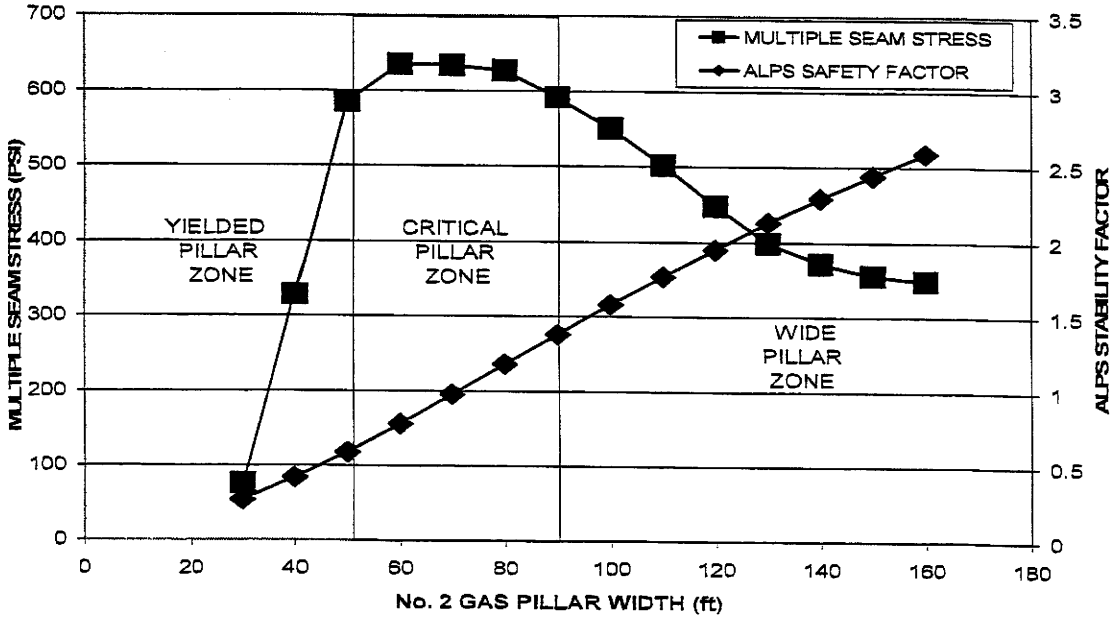

Figure 9. Peak multiple seam stress transfer values and the ALPS SF's for modeled pillar widths.

As stated in the case history analyses section, 6 out of the 7 major interactions occurred when the Harris depth of cover was 1,000 ft or greater and when the ALPS SF was less than 1.50 (figure 4). The cover relationship is noteworthy, in that, most operators maintain that there is a correspondence between multiple seam interaction difficulties and overburden. Typically, operators state that troubles generally begin occurring at roughly 800 ft of cover. Essentially, it takes a certain amount of cover load to cause downward load transfer problems. One possible explanation for the higher cover value at Harris may be interburden competency. It is conceivable that the three sandstone units which comprise 59 to 80 percent of the interburden are bridging, and therefore dampening the downward load transfer. As for the Harris ALPS SF's, figure 4 suggests that the probability of a major interaction occurring decrease as the stability factor increases. The same can be said for the No. 2 Gas ALPS SF's. As shown in figure 5, 5 out of 7, or 71 pct of the major interaction cases occurred when the No. 2 Gas ALPS SF was less than 1.0 and the depth of cover was 1,000 ft or more in Harris. Based on the above mentioned findings, a certain amount of concern and supplemental support are probably warranted when dealing with deep cover and lower upper and lower seam ALPS SF's. Like the old longwall adage goes, "it is better to be safe than be shut down." (It should be noted that multiple seam stress transfer values were not taken into account when determining the ALPS SF's listed in the Appendix or shown on the figures.)

Data analyses also indicated that there was no relationship between the degree of interaction and the percentage of competent interburden. The same can be said for the interburden thickness/number of beds ratio. Conversely, there was a weak correlation with immediate roof rock competency. Generally, the Coal Mine Roof Rating (CMRR) was higher for the minor interaction cases. Another weak association previously indicated was the overburden/interburden thickness ratio value of 3.9. As a rule-of-thumb, problems generally do not occur until this ratio reaches 7 or 8. However, critically sized pillars may be an overriding factor in this particular situation.

CONCLUSIONS

The most significant findings of this investigation was that the size of the remnant upper seam structure can influence the extent of the multiple seam interaction. More specifically, this study suggests that smaller critically loaded upper seam pillars are more likely to cause lower seam ground control problems than are wider pillars. The LaModel program was used to examine this supposition and the results verified this premise.

This investigation also demonstrated how effective a tool LaModel is in determining multiple seam stress transfer magnitudes. Once this value is obtained, it can be incorporated into the ALPS or ARMPS programs to obtain a more realistic stability factor.

The back analyses of 17 gateroad case histories at Harris No. 1 indicate that the probability of a major multiple seam mining interaction occurring increases when: 1) the depth of cover is 1,000 ft or greater, 2) the upper seam pillars are critically loaded, and 3) the Eagle seam pillars have a non-adjusted ALPS SF (excludes multiple seam load transfer) less than 1.50. In areas where these criteria are met, Harris engineers have mitigated problems through pillar design modifications and the installation of supplemental support. Based on past experiences, the engineers at Harris have determined that an adjusted ALPS SF in the 1.0 to 1.2 range provides satisfactory results.

Finally, the analyses also identified a weak correlation between the degree of multiple seam interaction and the immediate roof rock competency (CMRR) and the overburden/ interburden thickness ratio. However, no relationship between the degree of interaction and the percentage of competent interburden or the interburden thickness/number of beds ratio was evident. This may be attributable to the lack of variability in this site specific data base. Possibly, the conclusions drawn from the analyses of the nation-wide multiple seam mining data base will concur with previous researchers' findings.

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APPENDIX

Harris No. 1 Case History Data Base

Case	H	h	LC	SF	INT	COMP INT %	No. 2 Gas h	LC	SF	H/ INT	INT/ # Beds	Angle	CMRR	Rating and Comments
1	750	6.6	TGL	1.34	180	62	6.0	ISO	1.69	3.2	25.7	33	54	(1) No problems were encountered while crossing under isolated gateroads.
2	925	6.3	TGL	1.01	180	62	6.0	ISO	0.69	4.1	25.7	33	54	(1) No problems were encountered while crossing under isolated gateroads.
3	469	6.6	HGL	4.03	180	62	6.0	BL	3.49	1.6	25.7	33	54	(1) Headgate was driven under bleeder entries without any problems. Panel was recovered without gateroad cribbing.
4	875	6.7	HGL	1.86	176	59	6.0	HGL	1.15	4	25.1	32	63	(1) No problems were encountered during gateroad advance or panel retreat under gateroad pillars.
5	725	6.8	TGL	1.37	199	72	6.5	BL	2.90	2.6	33.2	0	47	(1) Gateroads were successfully driven under longwall bleeder entries the entire length of the panel.
6	800	6.8	TGL	1.18	180	62	6.0	ISO	1.50	3.3	25.7	33	54	(2) Additional gate entry cribbing was required while crossing under isolated gateroads.
7	1000	6.1	TGL	0.90	193	74	6.0	ISO	0.93	4.2	32.2	33	56	(2) Additional gate entry cribbing was required while crossing under isolated gateroads.
8	1100	6.2	Dev	2.29	193	74	6.0	ISO	0.75	4.7	32.2	33	56	(2) Poor ground conditions required cable bolting on development while crossing under isolated gateroads.
9	800	6.8	TGL	1.20	193	74	6.0	ISO	0.87	3.1	32.2	33	56	(2) Additional gate entry cribbing was required while crossing under isolated gateroads.
10	1050	7.2	Dev	2.16	193	74	6.0	ISO	0.85	4.4	32.2	33	56	(2) Poor ground conditions required cable bolting under isolated gateroads.
11	1000	7.1	TGL	1.07	201	80	6.0	ISO	0.60	3.9	50.3	25	44	(3) Tailgate entries located below isolated gateroads experienced several roof falls. Numerous tensioned cable bolts were installed on 4 foot centers.
12	1200	7.3	TGL	0.52	201	80	6.0	ISO	0.34	5	50.3	25	44	(3) During face recovery, tailgate entries situated below isolated gateroads experienced excessive floor heave and roof falls.
13	1200	6.9	HGL	1.18	176	59	6.0	BL	0.95	5.8	25.1	32	63	(4) During panel recovery, 500 ft of tailgate closed.
14	800	6.1	TGL	1.30	180	62	6.0	BL	1.88	3.4	25.7	33	54	(4) During panel recovery, 1200 ft of the headgate entry heaved closed.
15	1000	6.3	HGL	1.49	199	72	6.5	ISO	0.78	4	33.2	0	47	(5) During panel recovery, the tailgate squeezed closed under a headgate.
16	1000	6.2	BL	1.46	178	71	6.0	BL	1.42	4.6	35.6	58	71	(5) During panel recovery, 750 ft of a 4 entry bleeder system squeezed shut.
17	1200	5.8	HGL	1.44	192	66	6.0	BL	0.86	5.3	32	76	44	(5) The headgate squeezed closed beneath bleeder entries after panel extraction.
18	1181	6.8	LW Face	N/A	192	66	6.0	ISO	0.73	5.2	32	14	44	(2) Two feet of face heave occurred while mining under isolated gateroads.
19	1000	6.7	LW Face	N/A	199	72	6.5	ISO	0.69	4	33.2	0	47	(2) Two feet of face heave occurred while mining under isolated gateroads.
20	675	7.6	LW Face	N/A	199	72	6.5	ISO	1.77	2.4	33.2	0	47	(2) Two feet of face heave occurred while mining under isolated gateroads.
21	1200	5.7	LW Face	N/A	178	79	5.1	LC2	15.86	5.7	44.5	63	62	(5) Longwall face went on squeeze under a gob/barrier pillar boundary.
22	1200	6.6	LW Face	N/A	213	71	6.5	BL	1.22	4.6	35.5	90	44	(5) Roof falls and weight on the face halted recovery under bleeder/gob boundary.

Legend	
Angle	Intersection Angle
BL	Bleeder Loading
CMRR	Coal Mine Roof Rating
COMP	Competent
DEV	Development Loading
H	Mining Height (ft)
h	Overburden (ft)
HGL	Headgate Loading
INT	Interburden Thickness (ft)
ISO	Isolated Loading
LC	Loading Condition 2 (ARMPS)
LC2	Loading Condition
LW	Longwall
N/A	Not Applicable
SF	Stability Factor
TGL	Tailgate Loading
# Beds	Number of Beds in Interburden
%	Percentage

Rating Scale

1 Panel was developed and retreat mined with little or noevidence of multiple seam interactions.

2 Panel was developed and retreat mined with minor to moderate floor heave (less than 2 feet) and/or rib sloughage (less than 4 feet). Infrequent roof falls may also have occurred.

3 Panel was developed with minor difficulties. On retreat, pillars were occassionally abandoned due to roof falls and/or heavy pillar loading.

4 Panel was developed with greater difficulties and several pillars were lost on retreat due to adverse conditions.

5 Panel was extremely difficult to advance and could not be retreat mined.

6 Ground conditions necessitated that the panel be abandoned on development or deteriorating conditions over time closed the section

PILLAR DESIGN AND STRATEGIES FOR RETREAT MINING

By Frank E. Chase[1] and Christopher Mark[2]

ABSTRACT

One of the keys to miner safety and an efficient recovery of the reserves is to design sufficiently sized production pillars that will prevent pillar squeezes, excessive pillar spalling, severe floor heave, roof falls, and pillar bumps. Currently, few mine operators design sections that will be retreat mined using empirical formulas or numerical models that estimate abutment pressures generated by adjacent mined-out workings. The U.S. Bureau of Mines is in the process of field testing and refining a "user friendly" computer program called Analysis of Retreat Mining Pillar Stability (ARMPS) to estimate abutment pressures developed during pillaring. Analyses of 68 pillar design case histories using the ARMPS program indicate that it can be successfully employed to predict pillar line stability during retreat mining operations.

INTRODUCTION

Use of remote-control miners, extended-cut waivers up to 12 m (40 ft), and mobile roof supports have enabled room-and-pillar retreat mining (also referred to as pillaring, robbing, and second mining) to be competitive with longwall mining. While longwall mining can claim an admirable safety record (*12*),[3] the same cannot be said of retreat mining. During the period between 1989 and 1993, 29% of the roof fall fatalities occurred on retreat mining sections. One of the most hazardous underground operations during retreat or any other type of mining is the removal of the push-out stump. Over a recent 10 year period, 10% of the fatalities resulting from roof or rib falls occurred during the removal of the push-out stump (*11*).

Roof fall accidents are not the only problem associated with retreat mining. Each year, considerable amounts of coal are lost because of squeezes, heave, pillar line roof falls, and pillar bumps. Yet few empirical formulas or numerical models are available that can estimate abutment pressures that develop when gob areas are created during pillar extraction. As part of its goal to reduce injuries and fatalities, the U.S. Bureau of Mines (USBM) is field testing and refining a method called Analysis of Retreat Mining Pillar Stability (ARMPS) to aid in the design of pillar retreat sections. This paper presents the findings thus far.

ARMPS METHOD

The ARMPS formula is based on the Analysis of Longwall Pillar Stability (ALPS) method that is widely used for longwall pillar design (*8-9*). The ALPS method was originally developed from measurements of abutment loads in five longwalls and later validated by back analysis of more than 100 longwall mining case histories. To be useful for pillar retreat mining, the ALPS method had to be modified for the different extraction geometries that are created during pillar extraction.

[1]Geologist.

[2]Mining engineer.

Pittsburgh Research Center, U.S. Bureau of Mines, Pittsburgh, PA.

[3]Italic numbers in parentheses refer to items in the list of references at the end of this paper.

The goal of the ARMPS method is to help ensure that the pillars developed for eventual extraction (production pillars) are of adequate size for all anticipated loading conditions. The most severe loadings usually develop on the extraction front (or pillar line), particularly where older gob areas from previously extracted panels are nearby. The ARMPS method determines a stability factor (SF) as—

$$SF = LBC/LT, \quad (1)$$

where LBC = estimated load-bearing capacity of pillars within active mining zone (AMZ)

and LT = estimated load applied to pillars within AMZ.

The AMZ is defined as being the width of the extraction front and three pillars deep (fig. 1).

Studies of longwall gate entries have indicated that three rows of pillars typically behave as a single system and that an SF calculated for the system as a whole is more representative of conditions than an SF calculated for individual pillars.

The load-bearing capacity of the AMZ is calculated as the sum of the load-bearing capacities of the pillars within it. The strength of an individual pillar (SP) is determined using the Bieniawski formula (*3*):

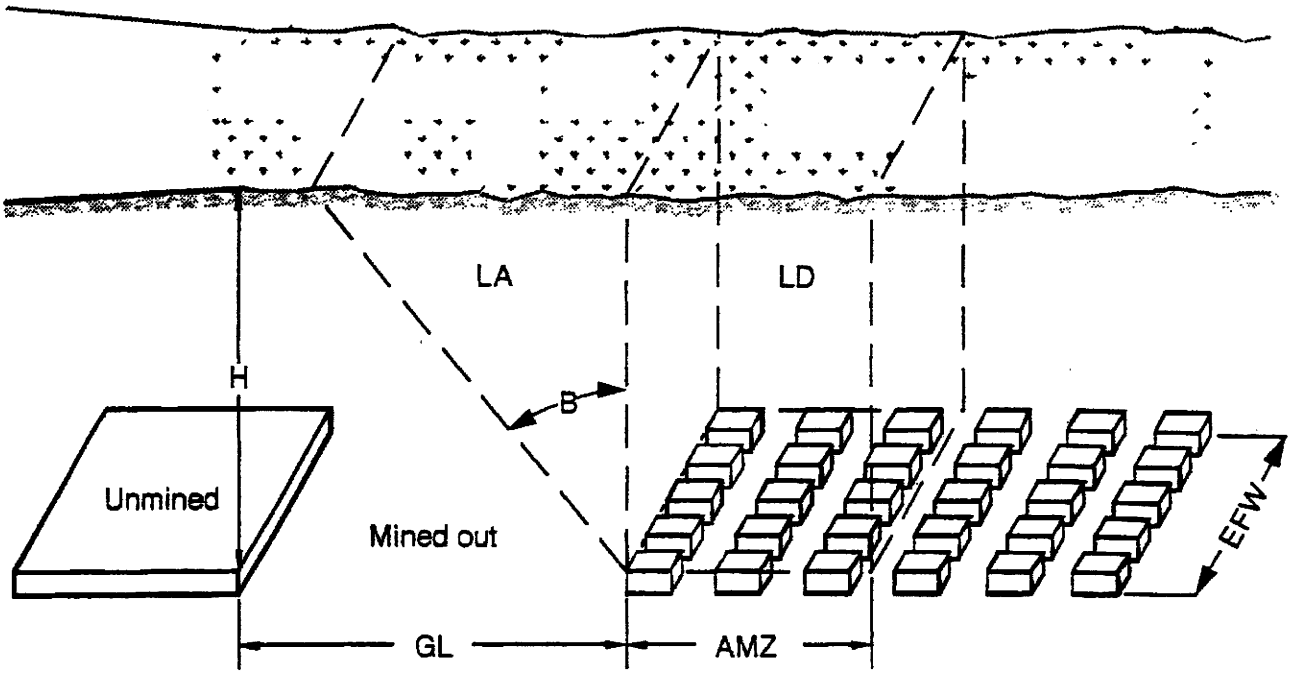
$$SP = S_1 [0.64 + (0.36\ w/h)], \quad (2)$$

where S_1 = in situ coal strength [assumed value = 6.2 MPa (900 psi)],

w = pillar width,

and h = pillar height.

Longwall studies have indicated that 6.2 MPa (900 psi) is normally the appropriate value for S_1 for use in this formula (*8*), and this value was used in all the case history analyses discussed. Current indications are that both coal strength and floor strength may be more important during pillar retreat than they are in longwall operations.



KEY

AMZ	Active mining zone	H	Depth of cover
B	Abutment angle	LA	Abutment load
EFW	Extraction front width	LD	Development load
GL	Mined-out area		

Figure 1.—Schematic of active mining zone.

The loading applied to the AMZ (fig. 1) is the sum of—

- Development loading present before pillar retreat and
- Abutment loads created by load transfers from adjacent gobbed-out areas.

The development load (LD) is estimated using the tributary area formula—

$$LD = (H)\ (\gamma)\ (AT), \quad (3)$$

where H = depth of cover,

γ = unit weight of overburden,

and AT = total area of AMZ.

Abutment loads (LA's) are determined using either equation 4 or equation 5, depending on the length of the mined-out area (GL):

When $GL \geq 2\ (H \tan B)$,

$$LA = H^2\ (\tan B)\ (\gamma/2)\ (EFW), \quad (4)$$

and when $GL < 2\ (H \tan B)$,

$$LA = \left[\frac{(H)(GL)}{2} - \frac{GL^2}{8 \tan B}\right](\gamma)\ (EFW), \quad (5)$$

where B = abutment angle

and EFW = extraction front width.

The abutment angle value is dependent upon the caving conditions in the mined-out area. Three possible caving conditions have been found to occur. If good caving has developed in the gob areas and few stumps have been left, then the abutment angle is assumed to be the same as that used for longwall mining, or 21°. At the other extreme, if few stumps have been left, but caving has not occurred in the gob, then B = 90°. A third case arises when caving has not occurred and significant remnant pillars (fenders or stumps) have been left in the gob. In the later case, it is assumed that the remnant pillars have yielded and their strength is assumed to be 50% of that calculated from equation 2. Then B is adjusted so that the remnant pillars carry only the load they are capable of and the remainder is transferred.

In its current form, the program can analyze four loading configurations, as illustrated in figure 2. The simplest—loading condition 1—is development loading only. Loading condition 2 occurs where a panel is being fully retreated and no other mined-out areas are nearby. The total applied load is the sum of the development loads and the front abutment load. Loading condition 3 occurs where the AMZ is surrounded on two sides by mined-out areas and the pillars are subjected to development, side abutment, and front abutment loads. When the pillar line is surrounded by gob on three sides (sometimes referred to as bottlenecking), an additional side-abutment load results and loading condition 4 is produced.

Unfortunately, the irregular mining geometries that sometimes occur in practice can be difficult to categorize into one of these four loading conditions. Efforts are currently underway to expand the number of available loading configurations with numerical modeling.

VERIFICATION OF ARMPS METHOD

Design criteria have been established for the ARMPS method through back analysis of 68 case historics of pillar design from 10 different States. The case histories were obtained from mine visits and from the literature. Case histories cover an extensive range of geographic locations, roof rock cavability characteristics, extraction methods, and loading conditions. In addition, overburden thicknesses ranged from 53 to 591 m (175 to 1,938 ft), coalbed heights ranged from 0.9 to 3.4 m (2.8 to 11 ft), and pillar width-to-height ratios varied from 1.0 to 11.1.

Each case history was categorized as being either successful or unsuccessful. Unsuccessful cases (table 1) were deemed as being such because one or more of the following unfavorable conditions occurred:

1. Squeezes.
2. Massive pillar failure and resultant airblast.
3. Severe sloughage.
4. Excessive heave.
5. Numerous roof falls.
6. Coal pillar bump.

Case history loading conditions were categorized as being successful abutment loading, unsuccessful abutment loading, and unsuccessful development loading. Figure 3 clearly suggests that many failures, but few successes, have resulted when designs with ARMPS SF's of less than 0.75 were employed. Between SF's of 0.75 and 1.50, there seems to be a "middle ground," where both successful and unsuccessful cases are found. Based on figure 3, failure is unlikely when an ARMPS SF of 1.5 is employed. Bieniawski also recommends an SF of 1.5 for short-term pillars subjected to development loads only (3).

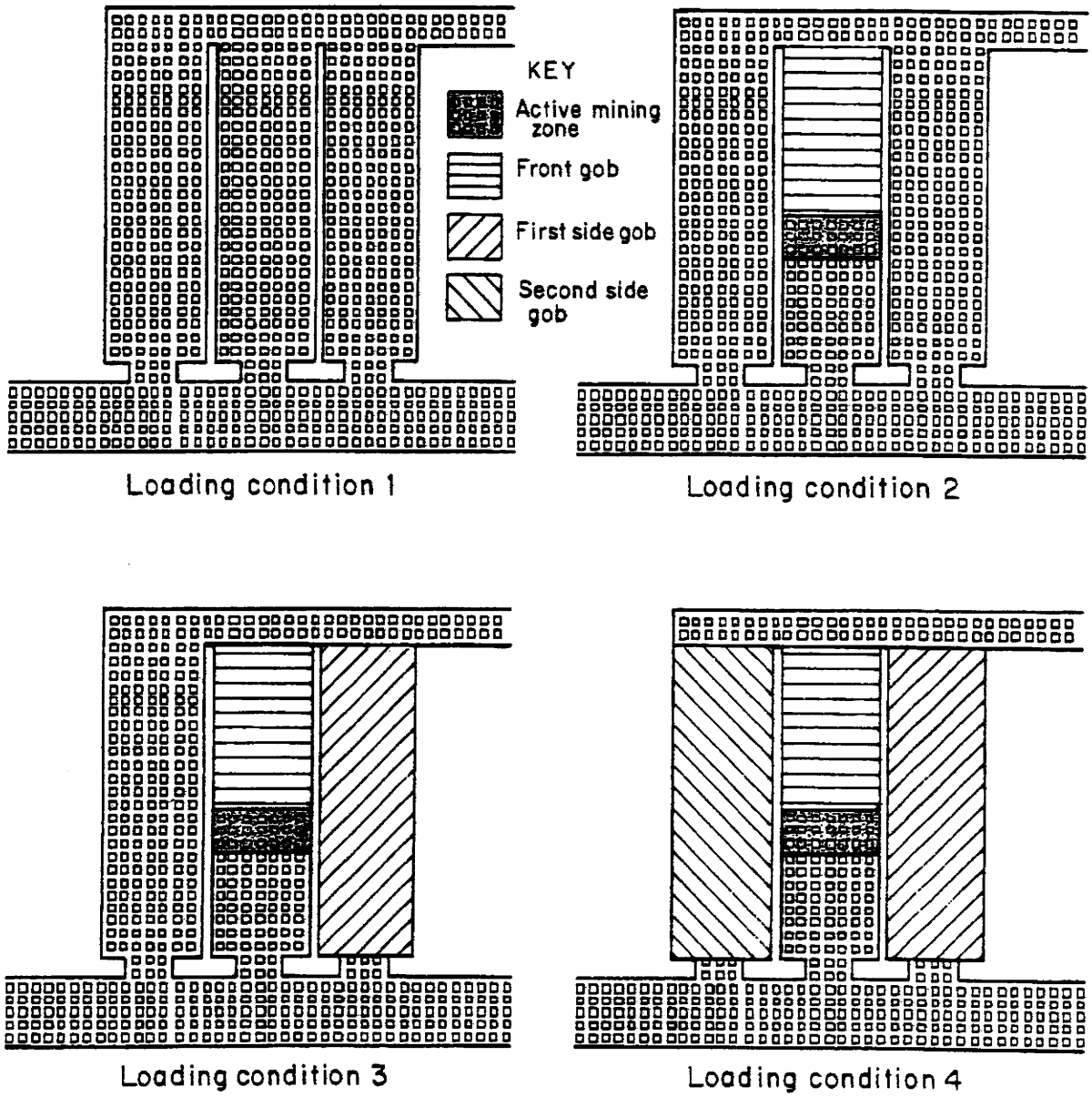


Figure 2.—Retreat mining loading configurations.

Table 1.—ARMPS values for unsuccessful pillar design case histories

Location	Coalbed	Source	Loading condition[1]	ARMPS stability factor	Comments
Alabama ...	Blue Creek	Mine visit	2	1.27	Pillar squeeze caused panel to be abandoned.
	..do.....	..do.....	2	1.11	Squeeze conditions caused 20 pillars 21 by 21 m (70 by 70 ft) to be lost.
Colorado ...	Cameo "B"	Abel (*1*)	1	0.57	Airblast generated by sudden collapse of 204 by 402 m (670 by 1,320 ft) of 3 by 24 m (10- by 80-ft) fenders.
Illinois	Herrin No. 6	Chugh (*6*)	3	.81	Roof falls, 56 cm (22 in) of floor heave, and severe sloughage.
Kentucky ...	Coalburg	Unrug (*16*)	3	[2].72	Inability to break roof caused excessive pillar spalling and heave.
	Harlan	Mine visit	1	.96	Coal pillar bump fatally injured roof bolter operator.
	..do.....	..do.....	1	1.06	Squeeze conditions caused 14 rows of pillars to be lost. Most of main entries were closed entirely.
	Hazard No. 4	..do.....	3	.43	Extensive pillar line heave, sloughage, and roof falls caused 9 rows of pillar to be lost.
	..do.....	..do.....	3	.46	Squeeze conditions caused 10 rows of pillar to be lost. Numerous roof falls and continuous miner was buried.
	Wallins	..do.....	4	.39	Severe pillar line weighting. Scores of fenders were lost after pillar splits.
Ohio	Pittsburgh	Artler (*2*)	2	[3].45	Squeeze conditions caused numerous pillars to be lost.
Pennsylvania	..do.....	Mishra (*10*)	2	.79	152 m (500 ft) of pillars were lost in 3 days. Large-scale squeeze 1,600 ft outby pillar line.
Tennessee ..	Beech Grove	Mine visit	1	1.34	Squeeze conditions essentially closed 671 m (2,200 ft) of main entries.
	..do.....	..do.....	3	.60	Section and barrier pillar abandoned because of squeeze conditions.
Utah	Gilson	..do.....	3	.44	Section abandoned because of violent coal pillar bump.
	..do.....	..do.....	2	.40	Excessive roof slaking and subsequent bump due to idle pillar line.
Virginia	Pocahontas No. 3 ..	Campoli (*4*)	1	.56	Numerous coal pillar bumps. 274- by 396-m (900- by 1,300-ft) area of pillars was abandoned because of squeeze.
West Virginia	Beckley	Mine visit	4	.84	Continuous miner was buried for 2 weeks. Crushed out cribs due to 0.9 to 1.2 m (3 to 4 ft) of heave.
	..do.....	..do.....	4	.61	Coal pillar bump during pillar split fractured roof bolter operator's leg.
	Coalburg	..do.....	1	.49	Squeeze that occurred in partially pillared workings caused 2 rows of 12- by 15-m (40- by 50-ft) pillars with SF of 1.37 to be lost.
	..do.....	..do.....	1	.66	Airblast generated by approximately 100 fenders collapsing blew out 26 cinder-block stoppings and fan-house weak wall. 1 miner was injured.
	..do.....	..do.....	1	1.17	10 rows of 12- by 12-m (40- by 40-ft) pillars were lost because of squeeze conditions.
	..do.....	..do.....	3	1.31	Dangerous pillar sloughage caused scores of pillar to be lost. Barrier pillar was also lost.
	Dorothy	..do.....	1	1.40	Airblast generated by massive pillar failure blew out 38 stoppings.
	Lewiston	Tang (*15*)	1	.63	Massive pillar failure, pillar squeeze, and severe spalling.
	..do.....	..do.....	1	1.20	Do.
	No. 2 Gas	Mine visit	4	.83	After losing several rows of pillars because of squeeze conditions, section was abandoned for fear of losing bleeders.

See footnotes at end of table.

Table 1.—ARMPS values for unsuccessful pillar design case histories—Continued

Location	Coalbed	Source	Loading condition[2]	ARMPS stability factor	Comments
West Virginia (cont.)	Pocahontas No. 4 ..	Campoli (*4*)	3	0.32	Crushed pillars and floor heave.
	.. do.	Mine visit	1	1.03	Airblast generated by failure of 117 pillars.
	Sewell	Peng (*13*)	3	1.45	Section abandoned because of concern that floor heave [0.6 to 0.8 m (2 to 2.5 ft)] might prevent equipment retrieval.
	Stockton	Mine visit	1	.74	Airblast generated by 140 fenders collapsing blew out 32 stoppings and fan-house weak wall.
	.. do.	.. do.	1	.72	Airblast generated by 90 fenders collapsing blew out 40 stoppings.
	.. do.	.. do.	1	1.29	Airblast generated by 72 fenders [6 by 12 m (20 by 40 ft)] and 50 pillars [9 by 9 m (30 by 30 ft)] blew out 70 stoppings.
	.. do.	.. do.	2	1.17	Squeeze conditions caused 22 pillars [12 by 14 m (40 by 45 ft)] to be lost.
NI	Lower Kittanning ..	Tang (*14*)	1	([4])	A massive failure of pillars occurred when pillars to left of chain pillar "A" were split. Severe entry roof falls occurred.
NI	Taggart	.. do.	1	1.14	Massive pillar failure 15 crosscuts outby pillar line.

Do. Same as above.
NI Not indicated.
[1]Loading condition 1 = development loading; 2 = development and front abutment loading; 3 = development, front abutment, and side abutment loading; 4 = development, front abutment, and loading from two side abutments.
[2]Abutment angle = 90°.
[3]Pillars measuring 4.6 by 12 m (15 by 40 ft) had an SF of 0.45.
[4]Pillars measuring 6 by 6 m (20 by 20 ft) had an SF of 1.32; pillars measuring 3.8 by 13.7 m (12.5 by 45 ft) had an SF of 1.08.

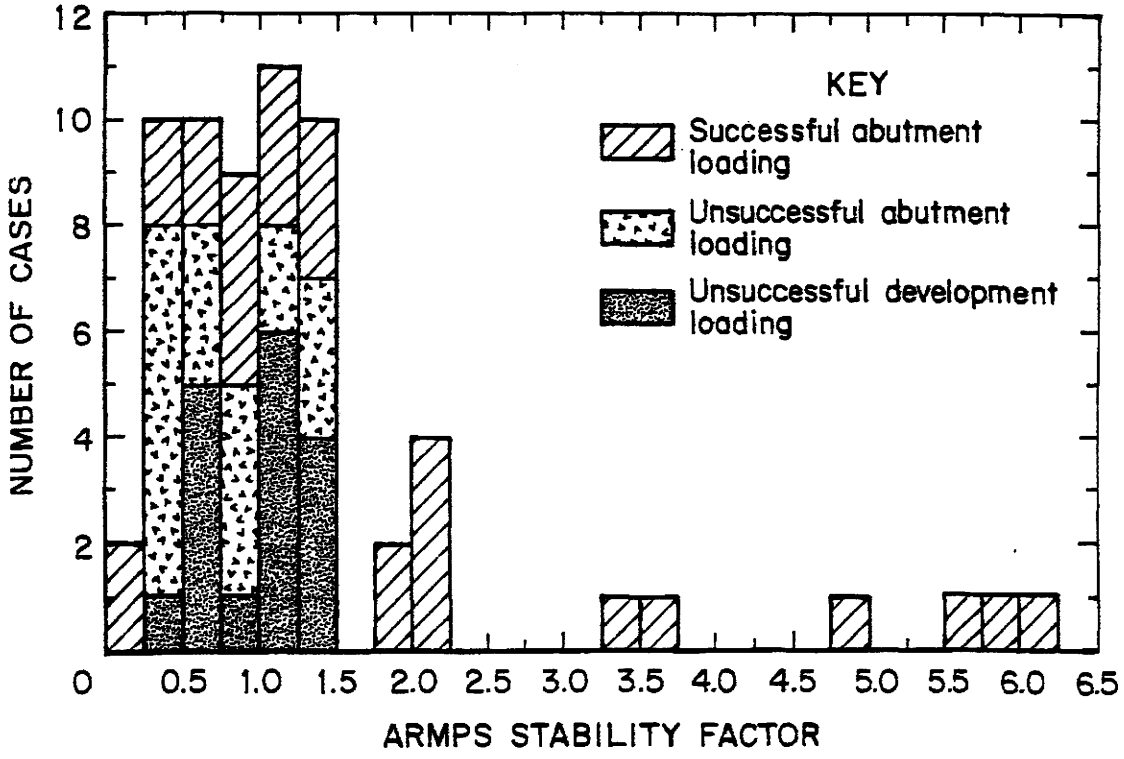


Figure 3.—ARMPS stability factors for case histories.

ADDITIONAL FACTORS INFLUENCING PILLAR LINE STABILITY

Abutment loads are not the only factor that should be considered in pillar design for retreat mining. Pillar line conditions are also markedly affected by multiple-seam interactions, the rate of pillar line advancement, and roof rock cavability characteristics. In the case of multiple-seam interactions, the best case scenario is to begin with the uppermost seam and to extract it as cleanly as possible. Any barrier, production, or remnants of production pillars (miners refer to these as stumps or sprags) left in the upper seam gob can transfer loads to pillars in the lower seam. However, this is dependent on the thickness and the geology of the interburden and the depth of cover (*5, 7*). The load transfer is more intense if the pillars and/or stumps left in the upper seam gob are underdesigned. In one mine visited in southern West Virginia that had extremely competent roof, the only unintentional fall that ever occurred on the pillar line or in the mine happened directly beneath a barrier pillar. In room-and-pillar retreat mining, the mains, barrier pillars, and panels that are to be retreated should be superimposed for optimum ground conditions.

In virtually every mine visited, operators indicated that the rate of pillar line advancement played a crucial role in overall pillar line conditions. When the pillar line moved slowly or remained idle over the weekend or during a miner's vacation, normally stable pillars began to take weight, as evidenced by sloughage, heave, and even squeeze conditions. Mine operators also remarked that timely pillar line advancement was even more critical when the coalbed thickened because high ribs taking weight caused large rib rolls, which are dangerous to the mine operator and helper.

The caving characteristics of the roof also affect pillar line stability. The Pittsburgh Seam has gained the reputation of having very weak roof where the Pittsburgh Sandstone Member is absent. During pillar retreat, the roof usually breaks directly inby the breaker posts, providing excellent pillar line conditions.

The other extreme roof condition, fairly common in portions of southern West Virginia and areas of eastern Kentucky, occurs where massive sandstones or siltstones [12 m (40 ft) and thicker] are directly above the coalbed. Such roof conditions have been associated with sudden, widespread pillar collapses that, in turn, can cause damaging airblasts (fig. 4). Evidence indicates that massive and competent roof rock units are able to bridge relatively wide spans, particularly when they are aided by the support provided by the regularly spaced remnants of production pillars. When the extraction area is still small, the remnant pillars are not subjected to the full overburden load because of the stiffness of the roof. A pressure arch is created, with most of the weight being carried by barriers surrounding the extracted area. Eventually, the bridging capability of the main roof can be exceeded, either by overextending the extraction area or by the weakening of the roof and/or remnant pillars over time. Once the pressure arch breaks down, the structural characteristics of the system are such that sudden, massive pillar failures can occur (*17*). For example, at one of the mines visited during this study, production pillars measuring 12 by 12 m (40 by 40 ft) were split down the middle, leaving 3- by 12-m (10- by 40-ft) fenders in the gob. Shortly after one panel was completed, an area measuring 152 by 152 m (500 by 500 ft) and containing approximately 100 fenders collapsed suddenly. The resulting airblast damaged the fan-house weak wall and 26 stoppings, and closed the mine for days. Fortunately, because of the location of the blast, only one miner was injured.

Underground observations and analysis suggest that two alternative strategies may be successful in preventing airblasts under competent roof conditions. One approach is to limit the partial pillaring conducted in a panel with the intention of designing for long-term stability. This can be accomplished either by increasing the size of the remnant pillars or by periodically leaving rows of unsplit pillars as barriers between smaller areas of split pillars. The latter was successfully employed in a southern West Virginia mine that experienced two moderate-to-severe blasts. The second strategy is to go to full pillar extraction. By removing the support provided by the fenders, the bridging capacity of the roof should be substantially reduced. If the roof does not break during full pillar extraction, caving can be induced through explosives (*16*).

In another mine visited, pillar splitting was responsible for three significant airblasts. Wanting to arrest the situation, the "Virginia three-cut method" was employed (fig. 5). The sequence in which the lifts are extracted are numbered as shown in figure 5. In the collapsed areas where 12 × 12 m (40 × 40 ft) pillars were split, the extraction percentage was 78% as opposed to 74% using the 3 cut method. However, the 3 cut method leaves non-uniformly spaced stumps that have an irregular geometry in the gob. According to the mine operator, these stumps routinely yielded and crushed out. Since the 3 cut method has been used in this mine, no airblasts have been recorded.

Finally, it appears that massive pillar collapses may be more likely where the floor and roof are strong. Where the floor is weak, the pillars should be more prone to punch, resulting in a pillar line squeeze.

Figure 4.—Concrete stopping damaged by airblast.

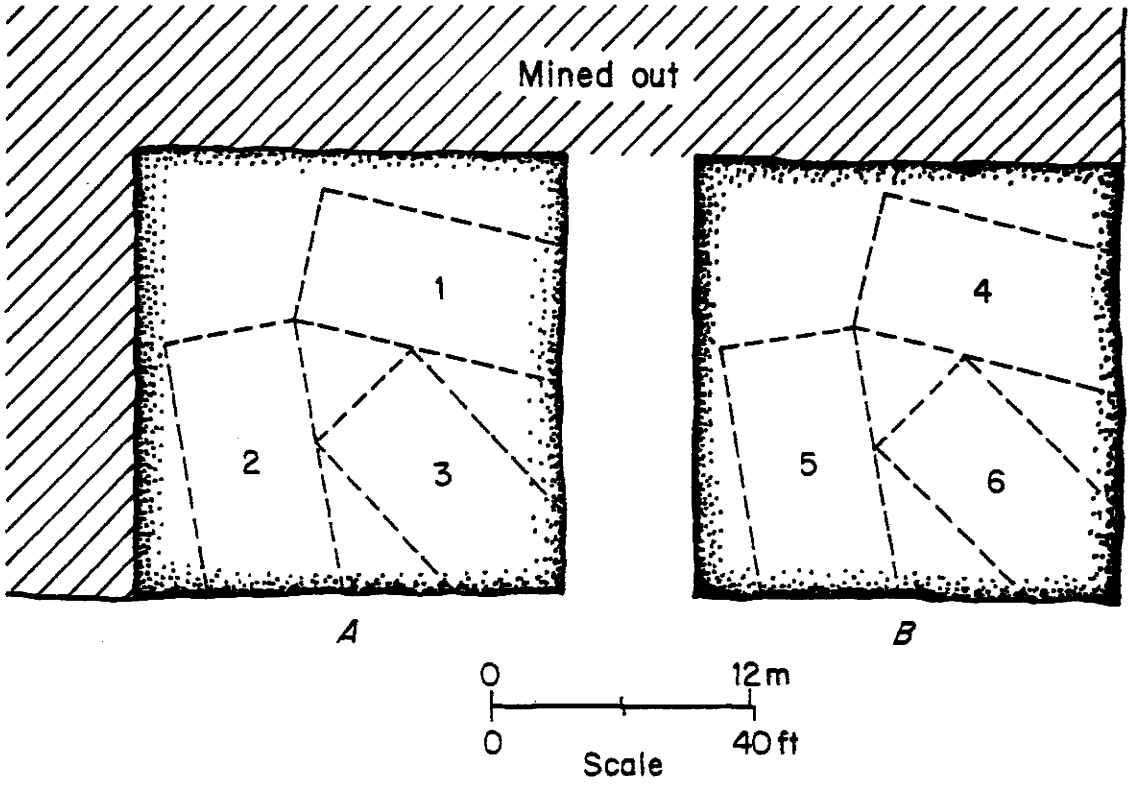


Figure 5.—Virginia three-cut pillar extraction method. *A*, First pillar mined; *B*, second pillar mined. (Numbers indicate sequence in which lifts are extracted.)

CONCLUSIONS

Information gathered during this investigation lends credence to the following conclusions:

1. Properly sized production pillars that are designed considering the front and/or side abutment pressures generated by gob creation can result in better miner safety and more efficient recovery of reserves.

2. Case histories analyzed using the ARMPS method examined an extensive range of geographic locations, depths of cover, width-to-height ratios, roof rock cavability characteristics, floor conditions, and extraction methods that are representative of the population as a whole. It appears that production pillars with an ARMPS SF of 1.50 or greater have a high probability of being extracted without a problem.

3. Multiple-seam interactions can have detrimental effects on pillar line stability. The effect is dependent upon the sequence in which the seams are mined, the thickness and geology of the interburden, overburden, and the presence of production pillars or stumps left in the gob.

4. Normally stable pillar line conditions often deteriorate if the pillar line moves slowly or remains idle for an extended amount of time. This deterioration can manifest itself in the form of excessive sloughage, heave, and squeezes.

5. Airblasts or squeezes have occurred in mines that have competent and massive roof rock units that will not cave. If partial pillaring is to be conducted under competent roof that will not cave, the long-term stability of the gobbed-out area should be considered. This can be accomplished either by increasing the size of the production pillar remnants or by leaving rows of unsplit pillars as barriers between smaller areas of split pillars.

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Coal Mine Burst Prevention Controls

Anthony T. Iannacchione, Principal Research Engineer
Stephen C. Tadolini, Chief, Rock Safety Engineering Branch
NIOSH-Pittsburgh Research Laboratory
Pittsburgh, PA

ABSTRACT

Coal mine bursts have represented a major hazard for U.S. mining operations for more than 90 years. During this time, many prevention controls have been developed and tested. This paper reviews 11 prevention control techniques. Although coal mine bursts are not common events in most underground coal mines, their occurrence almost always requires a change in mining practice. Over the many years of dealing with these hazards, specialized requirements for layouts and novel extraction sequences have been developed on a site specific basis. The keys to mitigating risks are to properly assess the coal burst hazards and to possess the knowledge and skills to prevent or remediate their occurrence.

INTRODUCTION

Coal bursts [1] are violent failures of ribs, roof or floor in underground coal mines. This hazard is not new to the US mining industry. Coal bursts are known to occur in complex ways and often under unique sets of conditions. This has made them extremely difficult to control or forecast. As one might expect, there have been many engineered prevention controls proposed to mitigate the devastating effects of these dynamic and violent failures. Over the years, specialized requirements for mine layouts and novel mining sequences have been developed on a site specific basis to more safely extract burst prone coal. While none of these prevention controls should be considered a "stand alone" design method, they are extremely useful when an operation is assessing its coal burst hazard and evaluating controls to help mitigate the associated risks. A coal burst risk assessment calls for engineers, managers and safety professionals, especially those who might deal with this hazard on a regular basis, to understand how to use these historically proven prevention controls.

Coal mine burst prevention controls tend to focus on qualitative solutions to very specific conditions. Operators need to consider the prevention control that most closely relates to the fundamental factors that are capable of producing coal burst hazards at their respective mines. Also, many of the following prevention controls can be thought of as recommendations or definition of things to do or not to do. They rarely provide methodologies to quantify actions lying between these two end-points. It should also be noted that this study did not discuss remediation controls, i.e., destressing.

[1] The authors use the term coal burst to avoid showing a preference for the eastern designation of coal bumps or the western usage of coal bounces.

ROOM-AND-PILLAR MINING ISSUES

Uniform Pillar Size and Shape

Early on, mining practitioners noted that uniform pillar sizes are less likely to produce burst prone conditions than layouts with a range of pillar sizes (Holland and Thomas, 1954). Reeves (1954) expressed apprehension in allowing abutment pillars to occur next to the gob. Large pillars are stiffer, and tend to deform or converge much less than their small chain pillar counter-parts. These stiffer structures tend to gather load. If they are then mined, there is a high potential for violent failure due to the larger pillar's greater energy storage capacity. Uniform pillar sizes are generally considered to be more advantageous during room-and-pillar mining; however, other controls may be necessary to fully mitigate coal burst hazards.

An example of this occurred in 1982 at the Olga Mine in southern West Virginia (Campoli, et al., 1987). Two miners were fatally injured while mining a pillar that contained gob on two sides. At the time of the accident, the pillar had been split into a number of different size pillars, including one large critical-size pillar, one smaller critical-size pillar and nine yield pillars (figure 1). The large critical-size pillar violently burst as it was being mined.

Uniform Extraction Fronts

When coal pillar bursts first began to occur in eastern Kentucky (Bryson, 1936), many of them were occurring along the retreating pillar line where uneven pillar lines were observed. Holland and Thomas (1954) realized that this practice was dangerous and issued a recommendation to avoid "pillar-line points". These section-wide mine plans can contribute to coal mine bursts when overlapping abutment pressures from converging gob lines cause excessive stress conditions in the pillar-line point area. The C-2 Mine bursts on November 20, 1996 that injured 6 miners, two fatally, provides one recent example where converging pillar lines were thought to be at least

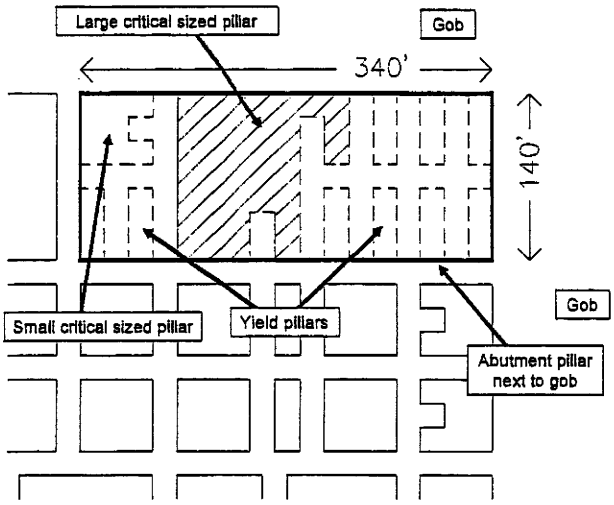

Figure 1. A larger, critically-sized pillar surrounded by smaller, critically-sized pillars and yield pillars near a gob acts to concentrate stresses and pose an increased risk for coal bursts.

partially responsible for the event (figure 2). It should be noted that there may be limits to the width of a uniform extraction front. Notely (1984), writing about coal bursts at the Springhill Coal Mine in Nova Scotia, Canada, provides evidence of this. Early in 1958, a series of bursts occurred at the mine that was thought to be caused by the staggered mining of three adjacent longwall faces. In an effort to rectify this problem, the mine operator altered the mining of these three longwall panels until one large mining front was formed. Unfortunately, this alignment was associated with the devastating October 24, 1958 Springhill coal mine bursts, where 74 miners were fatally injured. In this case, a very wide cave zone may have failed catastrophically, causing the fatal burst condition.

Bump-Cut

When pillar extraction occurs under excessive stresses and the pillars are critically-sized chain pillars, it is sometimes advisable to take a bump-cut of approximately 20 ft in length driven from the center of the rib toward the pillar core. The name was given to this individual cut sequence because of the frequent occurrence of audible seismic events that sound like thumps or bumps. The origin of the bump-cut method is unknown, but examination of old mining maps in the central Appalachian Coal Fields show that it was in use by the 1960's. The bump-cut should be the first cut that is extracted from a pillar during retreat mining. Typically this cut is made in the center of a critically-sized pillar so that the remaining coal, left on either side of the bump-cut, will readily yield. If the pillar is highly stressed, the bump-cut can act to release the load in a controlled fashion to adjacent pillars. In this way, a bump-cut is a means of destressing the pillar prior to full extraction with the continuous mining machine. The Deer Creek Mine in Utah (figure 3) has used the bump-cut method to destress a number of highly-stressed critical pillars along one of its gate entry developments (Iannacchione and Zelanko, 1995).

Pillar Sequencing

In the west, the Kenilworth Mines used a sequencing method to mine pillars along retreating extraction fronts (Reeves, 1954). This technique involved moving between as many as 5 pillars along the extraction line to gradually destress the pillars. The drill-and-blast mining system used at the Kenilworth Mine, lent itself to multiple active working faces. In the east, the Olga

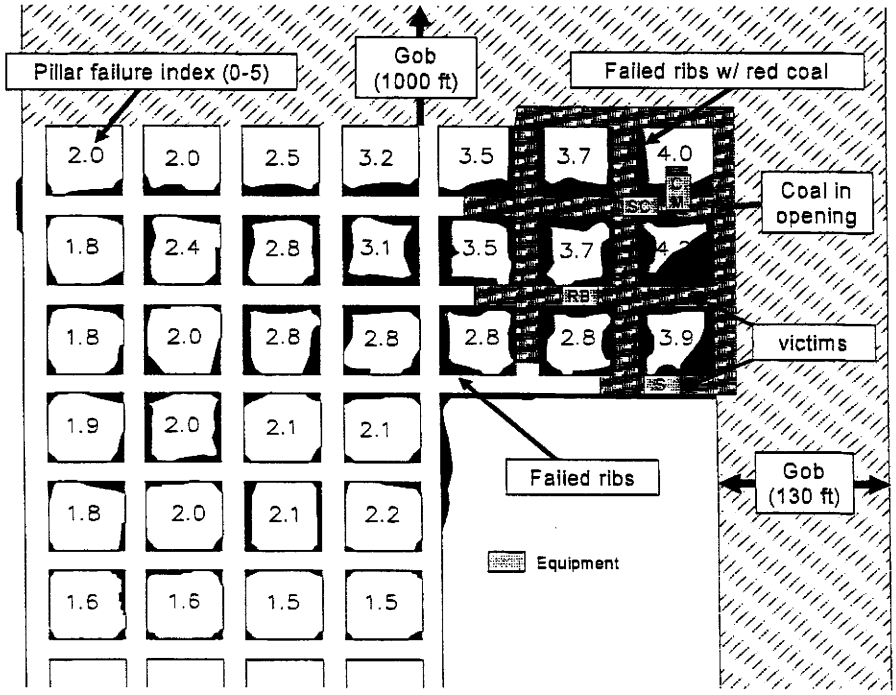

Figure 2. Map of the conditions observed by MSHA personnel after the C-2 Mine burst where converging pillar extraction fronts concentrated stresses at points of intersection.

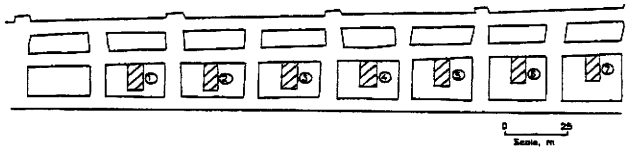

Figure 3. Example of partial pillar destressing method employed at the Deer Creek Mine.

Mines in southern West Virginia developed a systematic pillar sequencing method over many years of trial-and-error work. This retreat mining technique involves the sequential mining of numerous places over three to four rows of pillars in order to gradually direct the overburden loads away from the pillar line, where most of the miners and machines are located. An idealized schematic of the extraction sequence is shown in figure 4. By design, all coal pillars three rows outby the gob line would have at least a bump-cut. This bump-cut is mined from the middle of the crosscut toward the pillar core. When the pillars are two rows outby the gob line, they are split in half by extending the bump-cut entirely through the pillar. Finally, the pillar wings or fenders are extracted in the row closest to the gob line. Observations of the redistribution of rock pressures associated with this specific mining sequence were made by Campoli, et al., (1990a). The advantage of this system is that it avoids the use of multiple working places within a single pillar.

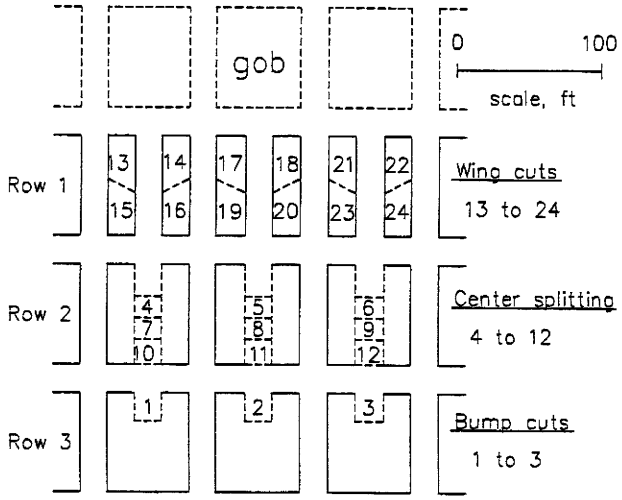

Figure 4. An idealized schematic of the extraction sequence used at the Olga Mine.

Barrier Pillar Splitting (Thin-Pillar Method)

In many large drift mines, during the later portion of a mines life-cycle, when it has developed to the full extent of its available reserves, the mine will begin to retreat toward its original mine entries. During this process, the barrier pillars that had been left to protect the main developments from the full extraction sections are mined. Many of these barrier pillars are bounded by at least one gob and can have in many cases two gob boundaries. Holland and Thomas (1954) recommended the barrier pillars be split into smaller sized pillars far in advance of the full-extraction mining process. The barrier pillars are highly loaded from the mining-induced stresses of the main entry development and the pillaring operations of the old gob. The additional loading from the current pillar line only compounds this situation.

The thin-pillar mining method was developed at the Gary No. 2 Mine in the 1950's and reported by Talman and Schroder (1958). The thin-pillar method segments the large barrier into chains of yield pillars (figure 5). During thin pillar mining, it is imperative that mining does not occur in areas that are excessively stressed. However, the thin yield pillars need to undergo some softening due to the pillar line loading. Therefore, outby thin pillar development must remain near the gob line. By design, the first cut into the barrier pillar that begins to outline a new thin pillar, encounters the most critical stresses. Mucho, et al. (1993) documented this process and analyzed the various signs used by the mine operator to evaluate the conditions of the pillars.

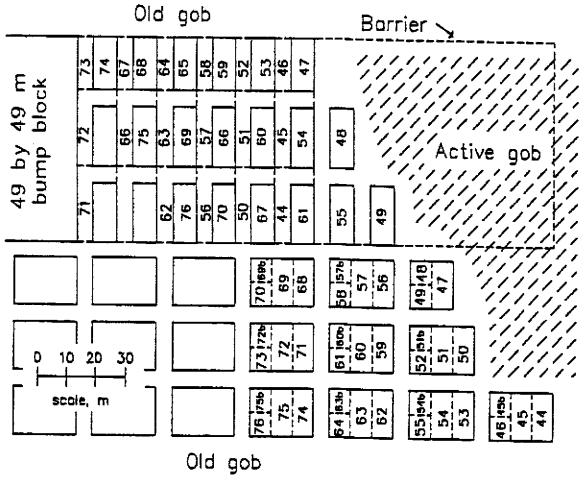

Figure 5. Typical mining sequence utilizing the thin-pillar method. Numbers indicate mining sequence order. Dual numbers indicate areas mined simultaneously (After Talman and Schroeder, 1958).

LONGWALL MINING ISSUES

Gate Entry Designs

In the eastern U.S., longwall mine designs in burst-prone ground centered on altering the size and shape of the gate entry pillars. This distinction between western and eastern coal mines was a direct result of their different ventilation requirements. Methane gas accumulations in the longwall gob and longwall bleeder entries represented a continuous challenge for these mining operations. Multiple gate entry designs were employed to increase provided the delivery of greater fresh air to the longwall face and inby to the bleeder entries in gassy mines. The gate entry pillars are designed to remain sufficiently stable to allow ventilating air to pass through the headings and into the inby bleeder entries where the methane coming from the longwall gobs is diluted to acceptable levels. These pillars had the added advantage of resisting load ride-over onto the active longwall face, thereby minimizing burst hazards in the face area.

Originally longwall gate entries were comprised of two or three rows of chain pillars (figure 6a). The first burst control technique was to use the yield-chain-chain design (figure 6b) to protect miners working near or within the tailgate entries. The yield pillar is designed to shed load and therefore is not expected to present a burst hazard at the tailgate corner. The yield-chain-yield design (figure 6c) positions the yield pillars adjacent to both the head and tailgate, again to lessen the potential for bursts

adjacent to these high traffic areas. The yield-abutment-yield design (figure 6d) utilizes an abutment pillar to protect the active longwall panel from the adjacent gob. This design was first utilized at the Jim Walters coal mines and brought to Virginia in the mid-80's to help control bursts in the gassy Pocahontas coal mines (Hendon, 1998). Campoli et al., (1990b) verified the performance of these systems through a series of detailed field studies.

Yield-Barrier Gate Entry Designs

As longwall mining increased during the 70's and 80's a number of innovative designs for controlling bursts were developed. The Mid-Continent coal mines in Colorado began to use a mining method where the longwall face advances slightly behind the developing gate entry headings (Reeves, 1978). This method is a modification of the advancing longwall system used extensively in Europe and Asia. It may help to control the burst hazards by reducing gate entry developments. In Utah, the Sunnyside coal mines, in cooperation with the US Bureau of Mines, experimented with a single entry system (Koehler, 1994). This system had the advantage of eliminating a major source of the burst hazards in longwall mining, the gate entry pillar. However, the major design used to mitigate bursts conditions in the western U.S. was the two-entry yield pillar system.

The ventilation requirements in western deep cover longwall mines were much different than eastern mines (Ferriter, 1985). First, the rugged terrain makes it very difficult to penetrate the longwall gobs with gob-vent boreholes or to place high-pressure, small diameter ventilation shafts within the bleeder system to adequately dilute the methane coming from the longwall gobs. These techniques are more popular in gassy eastern coal mines. Without these ventilation controls, it became increasingly difficult to dilute the methane gas to acceptable levels. Second, spontaneous combustion is a serious problem for western coal mines (Smith and Lazarra, 1987). The techniques most successful in mitigating spontaneous combustion rely on the removal of oxygen, largely by removing ventilating currents into the gob by deployment of ventilation seals around the longwall gob. This technique is known as the bleederless longwall system with U-shaped ventilation. The fresh air is typically delivered through the headgate entries, forced along the active longwall face, and carried away in the tailgate entries. In these ventilation systems, it is undesirable to have ventilation air pass beyond the face into the gob areas. The yield pillars are designed to yield outby the longwall face to facilitate full (tight) caving of the entries inby the face to hinder air movement between longwall gobs. A potential disadvantage of this design is that these yield pillars allow abutment load to ride over onto the longwall face and can increase bursts in the face area.

The traditional shallow-cover western gate entry design has been the double row of chain pillars (figure 7a). Under burst prone conditions, this gate entry design proved inadequate because the chain pillars had the potential to burst as the longwall face passed. At some mines, a row of yield pillars were placed next to the longwall tailgate (figure 7b) to lessen the potential for bursts in this area. However, this layout didn't eliminate the potential for headgate bursts. The two-entry yield pillar design was developed at the Sunnyside Mine to mitigate pillar bursts (figure 7c). This design is now used by many deep western

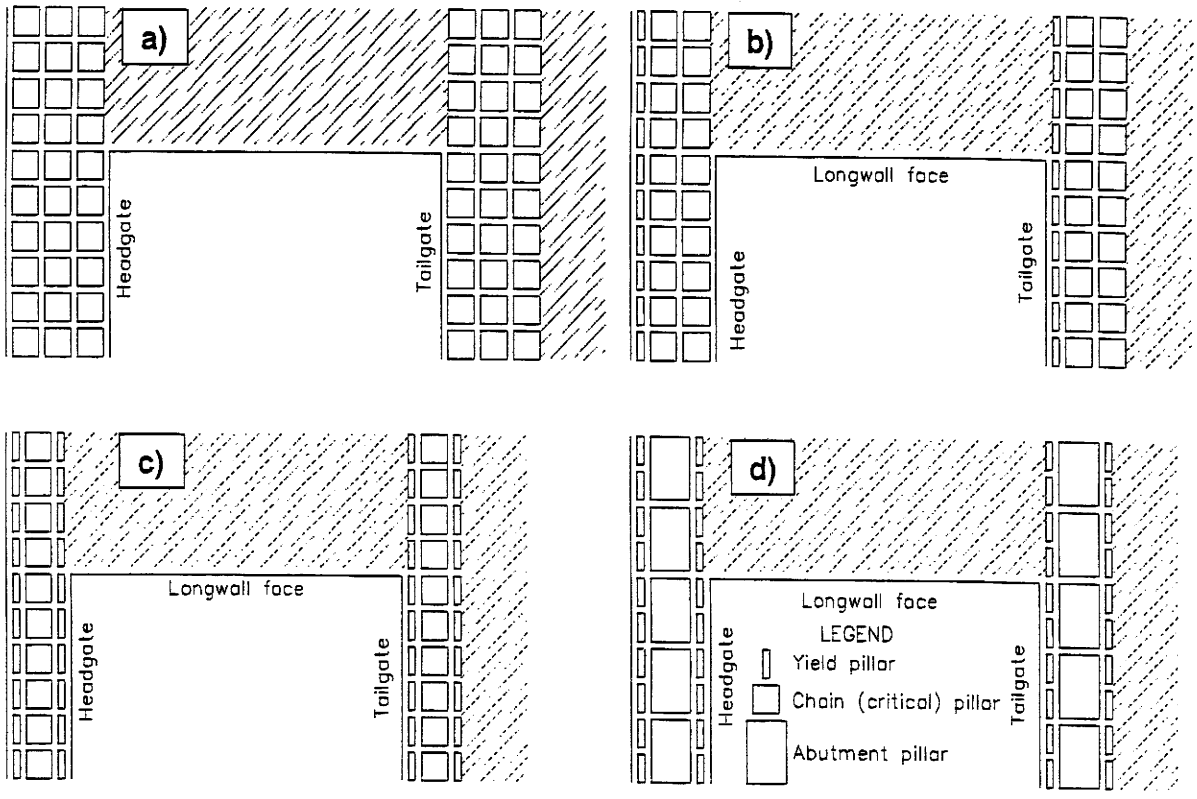

Figure 6. Yield-chain-abutment gate entry designs used in mines with high methane emission rates and coal burst potential – a) chain pillar design, b) yield-chain-chain pillar design, c) yield-chain-yield pillar design, and d) yield-abutment-yield design.

longwall mines. Unfortunately, under depths greater than 2000 ft, the frequency of longwall face bumps increased. To combat this trend, the Andalex Mine began to leave a barrier pillar between the previously mined panel and the tailgate of the adjacent panel (figure 7d). This yield-barrier design has now been used by several deep longwall mines as a means of mitigating longwall face bursts. The barriers range in width from 300 ft to more than 600 ft.

Critical Pillar Concept

The critical pillar concept for longwall gate entry systems identifies a certain range of pillar sizes that are more susceptible to coal bursts. Koehler, et al., (1996) define a critical pillar as one that is too large to either yield nonviolently or yield before the roof and floor sustain permanent damage, but is too small to support full longwall abutment loads. Ground control problems commonly associated with the use of critical pillars include frequent coal bumps, severe floor heave or roof damage and subsequent roof falls. A conceptualization of the relationship between critical pillars and yield and abutment pillars is presented in figure 8. The horizontal axis represents the minimum performance standard separating stable from unstable gate entry configurations. A pillar design whose performance falls above the horizontal axis is considered successful (stable), while a design whose performance falls below the horizontal axis is considered unsuccessful (unstable).

Where the use of pillars with width-to-height ratios greater than 3 to 5 is concerned, the concept of the critical pillar has often governed the performance experienced in deep western coal mines. DeMarco, et al., (1995) emphasized that increasing pillar width toward the critical-pillar range only invites the full weight of the overburden to be transmitted to a gate system that cannot possibly support it. As a result, critical pillars are to be considered extremely bump prone, even at shallow depths, when strong mine roof and floor conditions exist.

MULTIPLE-SEAM DESIGN

In an influential publication on multiple-seam mining, Mark (2007) discussed the different types of interactions:

- Undermining, where stress concentrations caused by previous full extraction in an overlying seam is the main concern; and
- Overmining, where previous full extraction in an underlying seam can result in stress concentrations and rock damage from subsidence.

In this study, overmining was generally found to produce more difficult ground conditions than undermining, and isolated remnant pillars cause more problems than gob-solid boundaries.

Multiple-seam mining has long been recognized as a contributing factor to the occurrence of coal bursts. One of the first U.S. longwall faces, Moss No. 2, experienced a burst on Jan. 8, 1970 and a second burst occurred on July 30, 1970 on an adjacent room-and-pillar panel (Iannacchione and Zelanko, 1995). Both of these events occurred while mining under a transition from the

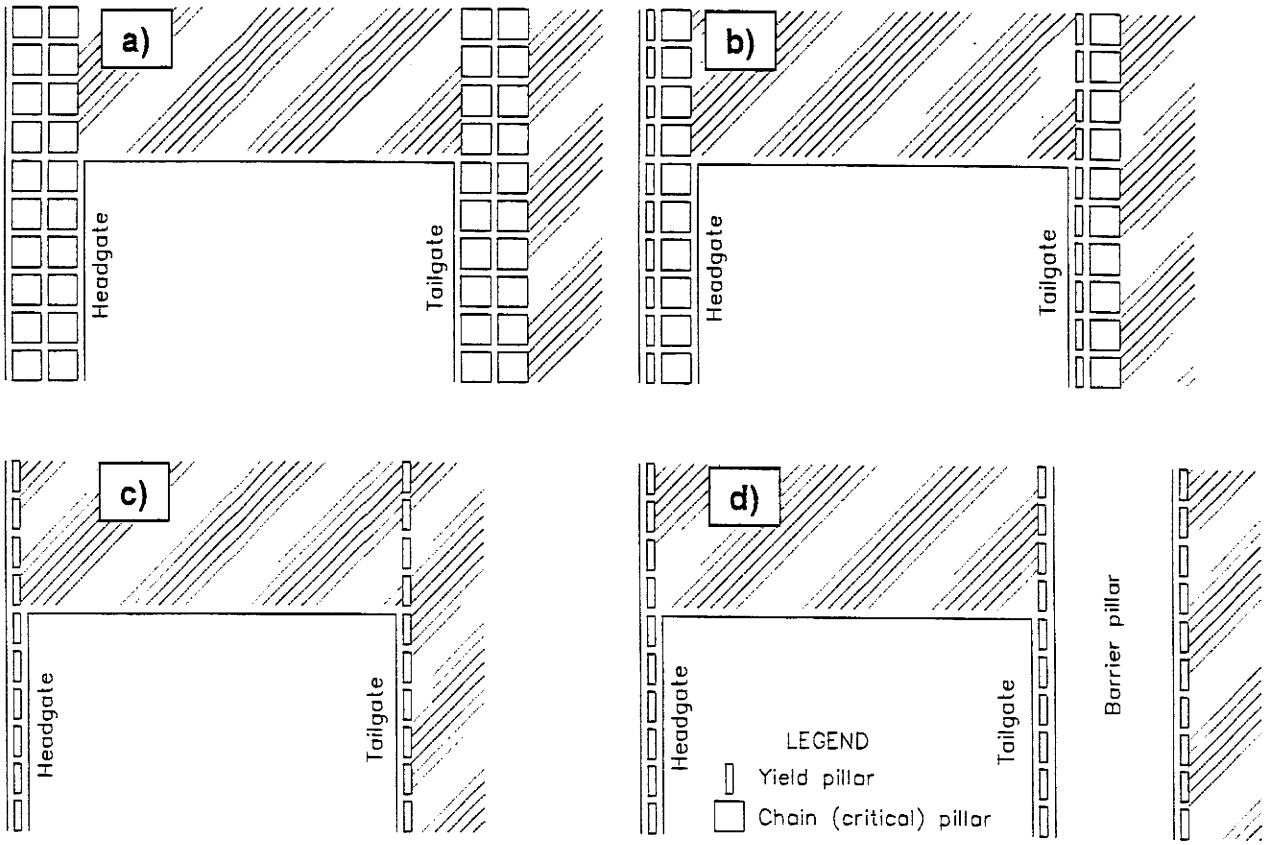

Figure 7. Gate entry designs used in mines with spontaneous combustion and burst potential - a) double chain pillar design, b) yield-chain pillar design, and c) yield pillar design and d) yield pillar-barrier design.

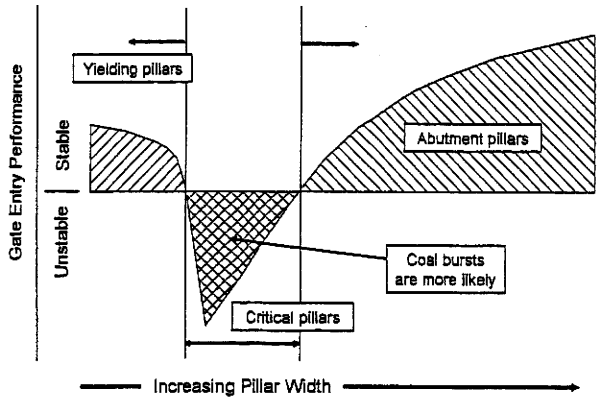

Figure 8. Conceptualization of the critical pillar concept showing the transition from successful yield pillar systems, through unsuccessful critical designs, to successful abutment pillar system (Koehler, et. al, 1996).

remnant pillar to a gob area in an overlying mine (figure 9). A more common factor influencing coal bursts is mining beneath a large remnant. One example of this took place at the Moss No. 3 Mine on Nov. 4, 1977. A burst occurred while splitting an abutment pillar in the Upper Banner Coalbed, located directly below another isolated abutment pillar in the overlying Thick Tiller Coalbed (figure 10). These two examples suggest that active operations may have a greater coal burst threat when mining beneath an overlying mine rather than mining over one, especially when the overlying mine has remnant pillars.

There are a number of rules that have been identified concerning how different overlying and underlying mine layout configurations can impact stress concentrations (Mark, 2007). For example, mining from the gob to the solid generally results in lower stress concentrations than from the solid to the gob. The type of remnant pillar structure (gob-solid boundary or isolated barrier) in overlying and underlying workings influences the degree of multiple-seam interaction. Isolated barriers cause more stress concentration problems than gob-solid boundaries (Mark, 2007).

NIOSH's Analysis of Multiple Seam Stability (AMSS) program can be used to evaluate the impact of multiple-seam mining on ground conditions. For more complex three-dimensional cases, where distribution of gob-side abutment loads between side abutment pillars and chain pillars are present, a numerical simulation is needed to determine the loading conditions. One of the most popular codes for stress and displacement evaluations is LAMODEL (Heasley, 1997).

ISOLATION AND AVOIDANCE PRACTICE

When the geologic and stress environments are well understood and burst conditions are highly probable, the best alternative is to avoid this area. If the hazard is thought to be associated with a particular geologic discontinuity or with an unwanted multiple seam configuration, isolation and avoidance may be required. An example of this occurred at the Lynch No. 37 Mine in Kentucky. This mine began operating in a new longwall district where a channel sandstone was observed to intersect several panels. The operation had not encountered these features in the past. The channels in this area were relatively narrow and did not scour more than one-foot into the top of the coalbed. Therefore, the coal height was sufficient for continuous longwall mining. However when

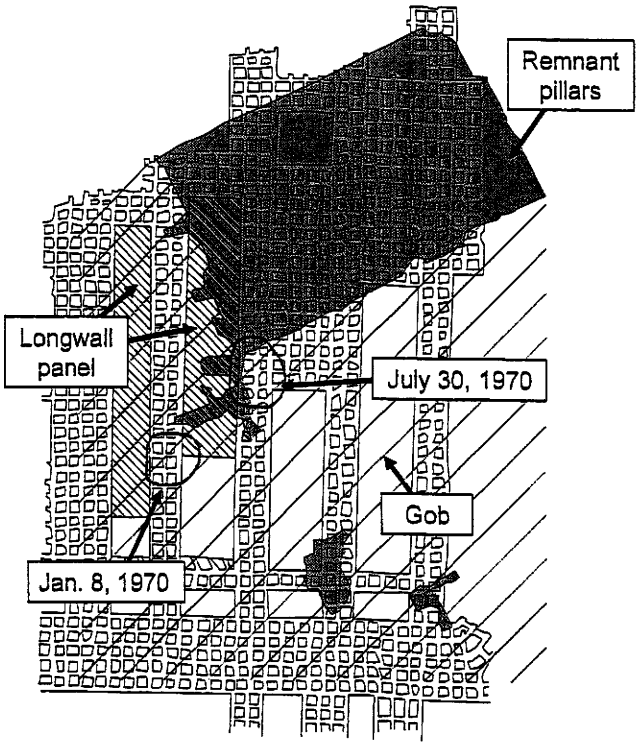

Figure 9. Coal burst events associated with longwall and room-and-pillar mining at the Moss No. 2 Mine and the location of overlying remnant pillar and gob mining.

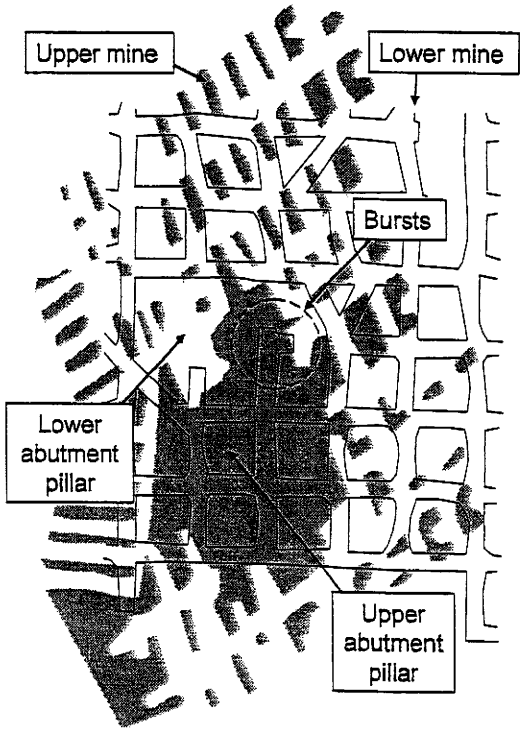

Figure 10. Burst occurred while splitting an abutment pillar located directly below an overlying large remnant pillar, Moss No. 3 Mine.

longwall mining encountered the first channel, a large burst occurred (figure 11). A second burst occurred before the longwall face could mine from underneath the channel. The mine operator had decided to "move around" the channel in the next longwall panel. As the longwall face approached the channel another face burst occurred. For this mine, the primary prevention control was to move around the projected paths of the sandstone channels to

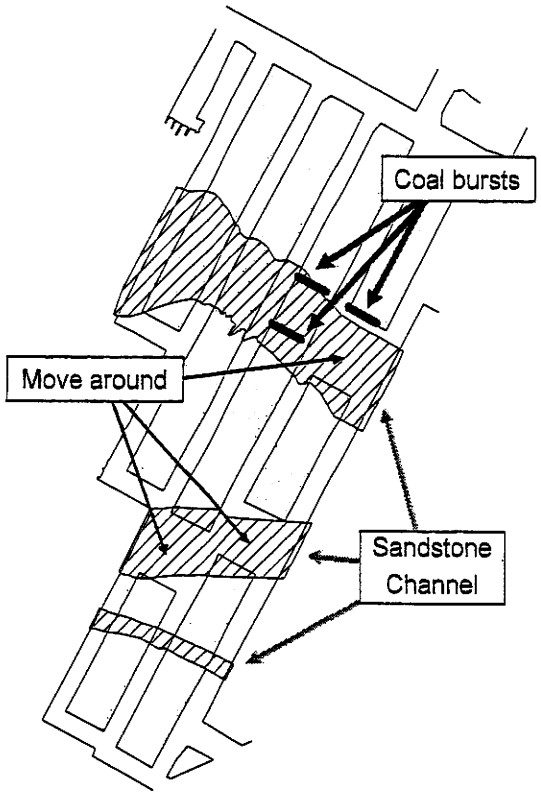

Figure 11. Longwall panels at the Lynch No. 37 Mine with associated sandstone channels and the locations of two large bursts events.

lessen the potential for coal bursts events (figure 11).

Large scale geologic discontinuities, i.e. faults, dikes, etc., have also been observed in close proximity to many coal bursts suggesting that they have some effect on the way the coal is loaded by the adjacent strata (Peparakis, 1958; Iannacchione and DeMarco, 1992; Maleki, 1981; Cox, et al., 1995; DeMarco, et al., 1995; and Osterwald, et al., 1993)

ADMINISTRATIVE CONTROLS, PERSONAL PROTECTIVE GEAR AND BARRIERS

Administrative controls, personal protective gear and barriers are generally used when engineering controls are not sufficient to mitigate the burst hazards at a mine. In some cases, it was possible to eliminate the risk presented by coal burst hazards simply through administrative controls that removed the miner from the hazardous environment. In other cases, it was necessary to provide the miners with protective gear to protect against out-bursting material. Barriers, i.e. belting deployed from the tips of shield canopies, etc., are also often used to shield the miners from the hazardous burst. These approaches were recently adopted at the Tower Mine in Utah (Anon, 2007). The mine operator installed equipment that allowed the longwall to be operated remotely or autonomously away from the most hazardous locations. The success of this control has not been determined, but the recent closing of the mine suggests some problems may have been encountered.

SUMMARY AND CONCLUSIONS

Coal mine bursts have been associated with underground mining for at least the last 90 years in parts of five states: Utah, Colorado, West Virginia, Virginia and Kentucky, During this time, much information on the occurrence, control and remediation of these events has been collected, analyzed and documented in technical manuscripts. These reports chronicle the many innovations that characterize the US mining industry. Two forms of engineering controls are used: prevention controls, i.e. layouts that mitigate burst conditions, and remediation controls, i.e. destressing, volley firing, water injections, etc. Prevention controls must be applied early in the mining process, prior to the mining of burst prone coal. Remediation controls are typically used when a recognized burst hazard exists and an action is required to safely mine the coal. Finally, it is sometimes prudent to simply avoid mining in burst prone areas. This paper focuses on the prevention controls developed over the last 90 years.

Coal mine burst prevention controls tend to focus on generic solutions to very specific conditions. Operators need to recognize the prevention control that most closely relates to the fundamental factors that are capable of producing coal burst hazards at their respective mines to achieve effective prevention control. Prevention controls examined in this paper are:

- Uniform pillar size and shape control – Abnormal pillar sizes can act to attract loads that might normally be distributed to adjacent smaller pillars.
- Uniform extraction fronts control - Uneven retreating of pillar lines can cause stress to accumulate at the point of intersection between these lines.
- Bump-cut control - If the pillar is highly stressed, the bump-cut can act to release the load in a controlled fashion to adjacent pillars. In this way, a bump-cut is a means of destressing the pillar prior to full extraction with the continuous mining machine.
- Pillar sequencing control – An effective means to redirect overburden loads away form the pillar line is accomplished by systematically mining small sections of pillars over three to four rows of pillars.
- Barrier pillar splitting (Thin-pillar method) - It is essential that barriers be split into smaller sized pillars far in advance of the full-extraction mining process. The size of these smaller pillars needs to be carefully considered. Sometimes an abutment pillar strong enough to support the overburden should be left in place.
- Yield-chain-abutment gate entry design (deep Eastern longwall mines) – High methane emissions require multiple gate entries (3 or more) in most deep and gassy eastern longwall mines. The use of an abutment pillar, flanked by yielding pillars, has proven to be an adequate gate entry layout in burst prone ground.
- Yield-barrier gate entry design (deep Western longwall mines) – Two entry yielding pillar gate entry layouts have become the standard for mines with spontaneous combustion and burst hazards. Typically, these pillars

are not capable of storing dangerous levels of strain energy during the longwall passage. Barriers between panels have been added for the deepest longwall faces to help protect against abutment ride-over.

- Critically-sized pillars - A critically-sized pillar is one that is too large to either yield nonviolently or yield before the roof and floor sustain permanent damage but is too small to support full longwall abutment loads. Such pillars should be avoided.
- Multiple-seam design – Mining beneath an existing overlying mine can increase the potential for coal mine bursts, especially when the overlying mine has remnant pillars.
- Isolation and avoidance - In some situations the burst hazard may present a risk that the mining operation is not willing to take. In this case, the best alternative is to avoid the area. This is best accomplished when the geologic and stress environments are well understood.

In conclusion, coal mine bursts are not common events in most underground coal mines. However when a burst occurs, it almost always represents a major hazard. There are a number of fundamental factors that influence their occurrence, producing a range of hazards and requiring a complex set of controls to lower mine worker and operational risk. Over the many years of dealing with this hazard, specialized requirements for layouts and novel extraction sequences have been developed on a site specific basis to safely mine coal when fundamental factors are present that promote the occurrence of bursts. The risks associated with these hazards can only be lessened if engineers, managers and safety professionals understand how to assess these risks and possess the knowledge to prevent or remediate their occurrence.

Disclaimer

The findings and conclusions in this paper have not been formally disseminated by the National Institute for Occupational Safety and Health and should not be construed to represent any agency determination or policy.

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TAB B

TAB B

Steve Rigby/PFO/UT/BLM/DOI
01/24/2011 04:43 PM

To Jeff McKenzie/UTSO/UT/BLM/DOI@BLM
cc Roger Bankert/UTSO/UT/BLM/DOI@BLM
bcc
Subject COP Development FOIA

Attached are my notes from conversations with Corey Heaps, of Rhino, and Kirk Nobis and Carl Pollastro, of Norwest.

As can be seen, there are only maps, highlighted sentences from the Draft R2P2, and a list of questions. These are what I used to base my conversations on with Castle Valley Mining as we tried to resolve questions we had on the R2P2 submittal.

This is all I have.

S. Rigby

Castle Valley Mining R2P2 Development - 1-24-11.PDF

12-22-10

Questions on Fan - Tank Scan

1. Dips?
2. Turn 1st Submains and mine back (updip) panels?
3. Panels mined on way in?
4. 5' cut-off? Areas
5. Adjust tons to 5' Configuration – show in R2P2
6. Barriers between districts/panels/Mains.
7. Color coding of Mains development
8. Names of Sections

Paragraph – mining sequencing remains same for LHMU mine out

1-24-11